CERTIFICATE

This is to certify that the dissertation entitled **"A CLINICAL STUDY ON PITHA PAANDU"** is a bonafide work done by **Dr. M.SHANMUGA PRIYA,** Government Siddha Medical College, Chennai – 600 106 in partial fulfilment of the University rules and regulations for award of **SIDDHA MARUTHUVA PERARIGNAR** under my guidance and supervision during the academic year 2014 – 2017.

Name & Signature of the Guide: **Name & Signature of the HOD:**

Name & Signature of the Dean/ Principal:

A CLINICAL STUDY ON

PITHA PAANDU

(IRON DEFICIENCY ANAEMIA)

WITH THE EVALUATION OF SIDDHA DRUG

SARAKONDRAI CHOORANAM

The dissertation submitted by

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CONTENTS

INTRODUCTION

INTRODUCTION

Siddha system of medicine is the ancient, unique & potent system among all the system. Siddha is a well-defined medical science through which the body as well as the soul is treated. In this system of medicine, all the systemic diseases are classified based on the vitiation of three humours, symptoms, line of treatment.

Siddha system is based on the concept of "FOOD ITSELF IS MEDICINE". This system emphasizes about a healthy body, pure soul and peaceful mind. Hence it is unique when compared to any other medical system.

The main aim of this system is "PREVENTION IS BETTER THAN CURE". Dietary and life style modifications play a major role in curing all the diseases. Due to dietary imbalance there is a variation in three thodams and brings about "Pitha Paandu".

According to Siddhars classification there are 4448 types of disease. Vellupu noi or Paandu noi is one of the major disease affecting women.(1)

According to WHO, Anaemia is a condition in which the haemoglobin content of blood is lower than normal as a result of nutritional deficiency.(2) As per modern science, Anaemia is not classified as a disease but it is a disorder which can affect pshychological and physical behaviour. Iron deficiency usually develops slowly & insidiously with no specific complaints.

According to Yugi Vaidya Chindamani there are six types of Paandu.(3) Based on this classification "Pitha Paandu" is discussed in this work. The symptoms of Iron deficiency anaemia are correlated with Azhal veluppu noi or Pitha paandu noi.

Nutritional Iron deficiency is the most common & widespread micro nutritional disorder in the world. Approximately one third of the global population is known to affected by Iron deficiency and it is a very common nutritional disorder in worldwide(4). Iron demand is high in menstruation & pregnant females.

Hypochromic anaemia due to iron deficiency is the commonest cause of anaemia in the world over and estimated about 20% in women and 2% in adult males.(5) Anaemia develops when the supply of Iron is inadequate for the requirement of Haemoglobin synthesis.(6)

Around 30% of the total world population is anaemic and half of these, 600 million people have Iron deficiency anaemia.[7] Iron deficiency anaemia is common in our country, because most of the people in our country are suffered from undernutrition unknowingly.

During pregnancy, it is estimated that 1200 mg of iron are required from conception through delivery. Micronutrient deficiency and especially Iron deficiency is believed to be underlying cause for anaemia.These are often referred as 'hidden hunger' because they develop gradually over time.

In India, the prevalence of anaemia is high due to low dietary intake, poor intake of Iron coupled with poor bioavailability. Globally, anaemia affects 1.62 billion people. According to Indian council of Medical Research (ICMR) surveys, prevalence of anaemia is very high in preschool children (80>90%) and adolescence girl.[8]

As per National Family Health Survey (NFHS) nearly 50 - 80% of Indian mothers suffer from anaemia due to Iron deficiency.[9] It occurs due to decreased production of RBC & increased destruction of RBC. The major cause for anaemia is imbalanced diet and poor nutritional status. In Siddha system this condition is called Paandu or Velluppu Noi.

According to UNICEF report two billion people suffer from anaemia, where 40-50% of children under age 5 are Iron deficient. It may cause a permanent loss of IQ in infants, difficulty with concentration, lethargy, poor mental development & learning capacity.[10]

The drugs used in Siddha medicine were classified on the basis of five properties: Suvai (taste), Guna (character), Veerya (potency), Pirivu (class) and Mahima (action). Proper diet, Medicine and a disciplined regimen of life are advised for a healthy living and to restore equilibrium of humours in diseased condition.

In traditional system of medicines there are several herbs use to manage Iron deficiency anaemia. I have chosen "SARAKONDRAI CHOORANAM" a purely herbal medicine used to treat Iron deficiency anaemia in this project.

AIM AND

OBJECTIVES

AIM AND OBJECTIVES

AIM:

The aim of the study is the management of PITHA PAANDU (Iron deficiency anaemia), both clinically and experimentally with the Siddha drug "SARAKONDRAI CHOORANAM" as referred in "Athma Ratchamirtham Ennum Vaithya Sara Sangraham".

OBJECTIVES:

- To collect the literature of both Siddha and Modern aspect of the disease, Pitha paandu and establish a correlation between them.
- To study the Efficacy and Safety of Sarakondrai Chooranam in the management of Pitha paandu.
- To study the Clinical course of the disease with observation on Etiology, Classification, Pathology, Prognosis, Complications and Treatment by Siddha aspect.
- To evaluate the Pathology of Pitha paandu noi by concentrating Mukkutram, Poripulangal, Udalkattugal and Envagaithervu.
- To have an idea about the incidence of the disease with Age, Occupation, Socio- economic status, Habits and Climate conditions.
- To have the Modern Parameters to confirm the Diagnosis and Prognosis of the disease.
- To have a Clinical trial on the disease Pitha Paandu with the Siddha drug Sarakondrai Chooranam.
- To evaluate the
    - Physico chemical analysis.
    - Bio chemical analysis.
    - Toxicological (Acute and Sub-acute).
    - Pharmacological studies (Haematinic activity in Phenyl hydrazine induced anaemia in wistar albino rat).
    - Bio-statistical analysis of trial medicine.

REVIEW OF LITERATURE

SIDDHA ASPECT

SIDDHA ASPECT

VERUPEYAR (SYNONYMS)

Velluppu noi , Venmai noi, Ven pandam.

IYAL (DEFINITION)

Vellupu noi is a disease of " Ratha Thathu" characterized by the change of colour of skin, conjunctiva, nails and tongue.(11)

As per **"AGASTHIYAR VAITHIYA KAAVIYAM",**

"கழிவாகுந் தேகமப்பா காணத்தச வத்தாய்
வற்றிவிடு மன்னவாசல் கேட்கில்
பழிகாரர் முகத்தினில் முழியார் போல பாண்டமெல்லாம்
வெளுக்கடித்தது ரத்தம்"

-Agasthiyar Vaithiya Kaaviyam

As per the above literature Pandu noi is a condition with the features of pallor of the conjunctiva, nail buds and body due to reduction in the haemoglobin concentration of the blood.

AETIOLOGY

Increased intake of salt, bitter foods,

Fever,

Diarrhoea,

Vomitting,

Kilvayu,

Menorrhagia,

Hypertension,

Dysentry,

Bleeding Piles,

Blood Vomitting,

Blood loss due to trauma,

Excess intake of toxic substances,

Helminthitic infections,

Fatigue,

Tuberculosis,

Amoebic dysentery,

Liver disease,

Tobacco, betel leaf chewing, arecanut,

Excessive intake of sand, ashes, sacred ashes and camphor.[12]

These are the factors for the disease Veluppunoi.

MIRKURIGUNANGAL:

The pitha thodam becomes excessive in activity due to factors such as diet and impairs the colour and volume of the blood. In addition, it also makes the body pale without affecting the nutritional requirement of the body. Later patient may develop fatigue of legs even walking for a short distance, dyspnoea, anorexia, nausea, giddiness, dimness of vision, frequent fainting, palpitation and emaciation of the body.

Siddhars explains the causes of Veluppu noi in many of their text,

As per **"Yugi Vaithiya Chinthaamani"**

"அறிந்துமே உற்பத்தி சொல்லக் கேளாய்
அதிசார மலமிளகி எந்நே ரந்தான்
பிறிந்துமே புளியுப்பு பெருத்த லாலும்
பெத்தமா மக்கினி யிருத்த லாலும்
மிறிந்துதாம் பூலமிக அருந்த லாலும்
மீறியே மதுக்களைத்தான் புசித்தலாலும்
பறிந்துமே பகல்நித்திரை செய்தலாலும்
பாண்டுவந்து பாரிலுள்ளோர் படும் பாடே"

-Yugi Vaithiya Chinthaamani.[13]

- Frequent dysentery,
- Excess intake of salt and sour items,
- Excess intake of betal leaves and arecanut,
- Excess heat production,
- Alcohol intake and sleeping in day time.

According to "**Agasthiyar Gunavagaam,**"

"தேரடா தேகத்திலே இரத்தம் வற்றித்

தீங்கான விந்தநோய் காணுமப்பா

கொள்ளடா அபக்குவ போசனத் தினாலும்

குடிகெடுத்த பெரும்பாடு கிராணியாலும்
கள்ளடா கருப்பத்தின் கிரந்தியாலும்
கனமான ரத்தத்தின் போக்கினாலும்
அள்ளடா அதியாம கவனத்தாலும்
அளவற்றவி சாரந்தானடையும் போதும்
தெள்ளவே தேகத்தில் இரத்தம் கெட்டு
தெளிவான பாண்டதுவு முண்டாம் பாரே"

-Agasthiyar Gunavaagadam.[14]

- Imperfect cooking,
- Menorrhagia,
- Dysentery,
- Congenital disease,
- Bleeding disorders,
- Insomnia,
- Over depression causes paandu.

According to "**Dhanvanthiri's Vaithiyam"**

"திருந்திடும் பாண்டுரோகஞ் சேர்ந்திடுங் குணத்தைக் கேளாய்
இருத்திடும் வாதபித்தச் சிலேற்பன மிவைதான் மாறும்
பரிந்துதா னொன்றோடி டொன்றுபொருந்துவதாலும் மண்ணேடரும்
ஆகிய மூலந்தன்னி லனைந்தவுட் டணத்தினாலும்
தோகையர் மேகத்தாலும் துயர்மிகு சோகத்தாலும்
தேகபேரினை யுள்ளோர்க்குந் தரித்திரஞ் சேர்தலாலும்
வேகமாந் திரிதோஷங்கள் மிஞ்சியே பாண்டுவாமே"

-Dhanvanthiri's Vaithiyam.[15]

- Derangement of thirithodam,
- Excessive heat production in the body,
- Gonorrheal diseases,
- Stress,
- Depression are the causes of anaemia.

According to **"Dhanvanthiri's Vaithyam"**

"ஏய்த்த வுட்டிணக் காலத்தில் எழும்பிடும் பித்தந்தன்னில்
சாய்த்திடு உப்புப்புளிப்பு மரிசனதானென்றும் பதார்த்தந்
சேர்ந்து பித்தந்தான் கெட்டுசிலேற்பனம் பொருந்தியதோர்
பாய்ந்து வண்ணந்தன்னை கெடுக்கும் பைத்திய பாண்டுவாமே"

- Dhanvanthiri's Vaithiyam.[15]

- Excessive heat,
- Intake of excess of salt, sour taste food items affects pitha thaathu,
- Selarpana thaathu also gets affected,
- Discolourations of skin are features of Pitha paandu.

In **"Noi Nadal Noimudal Nadal"**

"கிருமியால் வந்ததோடம் பெருகவுண்டு
கேட்கலதின் பிரிவதனைக் கிரமமாக
பொருமி வரும் வாயு வல்லாங் கிருமியாலே
புழுக்கடி போல் காணுமது கிருமியாலே
செருமிவரும் பவுத்திரங்கல் கிருமியாலே
தேகமதில் சோகைக் குட்டம் கிருமியாலே
சூட்சமுடன் கிரிமியகைத் தொழில் செய்வீரே"

-Noi Nadal Noimudal Nadal Thirattu.(16)

According to this Sobai occurs due to worm infestation which meant Vellupu noi.

In "**Agasthiyar Kanmakaandam Gowmathi Nool** ,

"நாமென்று சொல்லுகிறோம் பாண்டு வந்த
நலமான தருமமது சொல்லக் கேளுச்
தாமென்ற தாய்தந்தை மனம்நோகச் செய்தல்
தரணி தனிலுள்ள வர்க்கும்வம்பே சொல்ல
லாமென்று வுறுப்பழித்தல் செவி சுவாச
மற்றும் பொய் சொல்லாங் காரஞ் செய்தல்
வேமென்ற கருமமது பித்த மேறி
வெளுத்துடன் வெப்பு மிஞ்சிக் கைகாலோய்வே"

-Agasthiyar Kanmakaandam Gowmathi Nool.(17)

It states that person who insulting parents and made harsh arguments, liar and doing activities increasing pitham cause Paandu.

In "**Agasthiyar Paripooranam**"

சொல்லாத கடிவிஷங்கள் குன்மம் பாண்டு
துயர்தீராக் கன்மவினை செய்த பாவம்

எல்லோரும் நகைக்க உடம்பெடுத்த பாவி

இன்னமுண்டு விபரமாய் உலகிற் கேளே"

-Agasthiyar Paripooranam.[18]

This quote proves that Paandu noi is due to kanmavinai.

NILAM:

"குறிஞ்சி வருநிலத்திற் கொற்றமுண்டி ரத்தம்
உறிஞ்சி வருசுர முண்டாம் அறிஞரைக்
கையமே தங்குதரத் தாமை வல்லையுங் கதிக்கும்
ஐயமே தங்கும் அறி"

-Siddha Marutuvanga Churukkam.[19]

According to this people who lives in mountain areas have more chances for the occurance of Paandu noi.

CLINICAL FEATURES:

The features of Paandu noi are explained by Siddhars in their text,

In "**Yugi Vaithiya Chinthaamani**"

"வாமென்ற மேனியெல்லாம் மஞ்ச ளித்து
மகாவெளுப்பு உண்டாகி மந்தக் கண்ணாய்
தாமென்ற தாகமொடு மூர்ச்சை யாகுந்
தனிவாயில் மிளகுபோற் றானு முறைக்கும்
நேமென்ற நெஞ்சுமுள் தானு முண்டாய்
நெருக்கியே மூச்சுமுட்டதுவே யாகும்
கோமென்ற கிறுகிறுத்து வாய்கைப் பாகுங்
கிளர்பித்த பாண்டு வெனக் கூறலாமே"

-Yugi Vaithiya Chinthaamani.[20]

- Yellowish discolouration of body,
- The tongue, the upper and lower limbs will become pale,
- Paleness, dimness of vision,
- Giddiness,
- Bitter taste,
- Excessive thirst, ulceration of mouth,
- Dyspnoea,
- Flatulence,
- Bad odour in the mouth,
- Frequent diarrhoea with stool appearing yellow in colour,
- Desire to eat cold diet.

As per "**Pararasasekaram**"

"பித்தத்தி லெடுத்த பாண்டு பேசநா வறட்சியுண்டாம்
மற்றுடல் பசுமை யாகிமஞ்சளி னிறமுண்டாம்
ஊற்றிடு மூர்ச்சை தாகமொளி கெடுங் கண்ணமாழும்
தூற்றிடு மழற்சி வாயிற்றுர்நாற்றம் புளித்தேக்குண்டாம்

இருமலே யிளைப்பு நெஞ்சிலிடிப்புடன் உரப்புமாகிப்
பெருகவே நடக்கும்போது பேசமுட்டதுவே யாகும்
வெறுவுறக் கிருமிறுக்க மேனியும் வெளுத்ததைக்கும்
பெருகியே பித்தபாண்டு வாமென பேசினாரே

ஊதமெய் யதைத்துக் கைகாலோய்ந்துடன் சுரந்துநோவாகி
புதையவே வீங்குங் கண்ணும்போதவே வேளுக்குஞ் சோர்வாய்
பாதகர மகிலுமிஞ்சிச் சொறிவதா யசலுபற்றும்
வீதமுறு குணங்கள் பித்தபாண்டென விளம்பினாரே"

- Pararasasekaram.[21]

- Dryness of mouth,
- Greenish and yellowish discolouration of body colour,
- Lassitude,
- Excessive thirst,
- Bad odour in mouth,
- Indigestion,
- Cough, dyspnoe on exertion,
- Paleness,
- Cardiac murmurs,
- Oedema of body and limbs,
- Tiredness are the features of Pitha paandu.

As per "**Agasthiyar Vaithiya Rathna Surukkam**"

"உற்றதோர் அன்னபேதம் அரோசகம் உதரமந்தம்
முற்றிய மார்புநோய் மூத்திரம்பொன்னின் வன்மை
வெற்றி சேர்புறங்கால்கை கண்வீங்குடல் வெளுத்தல் வேர்த்தல்
பற்றி தொக்கிற்காய் பயித்திய பாண்டுவாமே"

-Agasthiyar Vaithiya Rathna Surukkam.[22]

- Indigestion,
- Change of taste,
- Flatulence,
- Chest tightness, yellowish discolouration of urine,
- Oedema of limbs,
- Paleness of skin,
- Sweatness are the features of Pitha paandu.

"ஆனகண் மலசங்கள் அணிநகங் கறுப்பதாங்
தாகமா மங்கமெங்கும் தடியடி படுகைபோல
கனமாய் நடுக்கமுண்டா விசைந்து துர்பலமுண்டாம்:"

- Agasthiyar Vaithiya Rathina Surukkam.[22]

- Discolouration of conjunctiva, urine, faeces and nails,
- Excessive thirst,
- Pain in whole body, lassitude,
- Fatigue.

In "**Agasthiyar Gunavaagadam**"

"உண்டாகும் வேளை தன்னில் தேகநேர்மை
உறுதியாய் சொல்லுகிறேன் நன்றாய் பாரு
குண்டான முகம்கண்கள் உதடு நாக்கு
குறிப்பான வாய்வேகும் தேகமுற்றும்
வெண்டாக வேயுலர்ந்து வெண்மையாகி
விரல் நகங்கள் முழுவதிலும் இரத்தம் வற்றி
குண்டான கால்கள்தாம் தணிந்து நிற்கும்
கருவான நாடியது மெதுவாய் போமே
போமேதான் தீபனங்கள் மட்டுப்பட்டு
பொலிவான கண்விழிகள் பெருத்து தோன்றும்
ஆமேதான் அசக்திய மாயாசம் கண்டு
அவரடையும் தவிர்ந்து பெருமூச்சு கண்டு
மூடேதான் மூர்ச்சையுடன் மார்துடித்து
முடிவான கணுக்காலின் வீக்கமுண்டாய்
தூமேதான் இருதயத்தின் வதனந் தன்னிற்
துருந்துதிகள் சத்தமது கேட்கும் பாரே"

-Agasthiyar Gunavaagadam.[23]

- Oedema of eyes,
- Ulceration of tongue,
- Pallor of nails,
- Weak pulse,
- Loss of appetite,
- Dyspnoe on exertion,

- Tachychardia,
- Oedema of ankle,
- Cardiac murmurs occurs.

As per "**Pathinen siddhargal naadi saasthiram**":

"இருமலு மிளைப்பும் நெஞ்சில் பிடியது மிகவுண்டாம்
வெகுபல கிறுகிறுப்பு மேனியும் வெளிறிப் போகும்
உருகிய பல்லும் நாவு காய்ச்சலுமிளைப்பு முண்டாம்
பெருகி பித்தபாண்டு யென்னவே பேசலாமே" (24)

- Cough, dyspnoea on exertion,
- Chest tightness,
- Giddiness,
- Pallor of skin,
- Anorexia are the features of Pitha paandu.

In "**Jeevaratchaamirtham**"

- Yellowish discolouration of urine and skin,
- Lassitude, loss of appetite,
- Dryness of tongue, fatigue,
- Palpitation.(25)

NOI ENN:

The types depending upon the classsifying authors,

According to "**Yugi Vaithya Chinthamani**"

"கூறவே பாண்டுவிடப் பெயரைக் கேளாய்
குறிப்பாக ஐந்துவித மாகும் பாரு
வாரமே வாதமாம் பாண்டு வோடு
மார்க்கமாம் பித்தத்தின் பாண்டுவாகும்
தேறவே சிலேட்டுமமாம் பாண்டு தானாம்

திரிதோஷப் பாண்டொடு விஷப்பாண்டாகும்

ஆறவே பாண்டுவிட வாண்மை யெல்லாம்

ஆராய்ந்து சொல்லவே அறிந்து கொள்ளே"

-Yugi Vaithiya Chinthaamani.(26)

- Vaadha Paandu
- Pitha Paandu
- Silethuma Paandu
- Thirithosa Paandu
- Visha Paandu

According to " **Agathiyar's Gunavagadam"**

"பாரடா பாண்டு வகை சொல்லக் கேளாய்

பரவான பாண்டது தானஞ் சேயாகும்

வாராடா விவாத பித்தம் சீத பாண்டு

வகையான விடபாண்டு மிருத்திகா பாண்டு"

-Agathiyar Gunavagadam (27)

- Vaadha Paandu
- Pitha Paandu
- Silethuma Paandu
- Vida Paandu
- Miruthiga Paandu

According to **"Dhanvanthiri Vaithyam"**

"பயித்திய பாண்டு வாத பாண்டுவே சிலேத்தும பாண்டு

வியத்திரி தோடப் பாண்டு வெளும் பித்த சிலேத்தும பாண்டு

பயித்திய வாத பாண்டு பகற் சன்னிவாத பாண்டு

நயப்புறும் பாண்டு வேழின் குணத்தை நான் நவிலலுற்றேனன்"

-Dhanvanthiri Vaithyam. (28)

- Vaadha Paandu
- Pitha Paandu
- Silethuma Paandu
- Thirithoda Paandu
- Pitha Vaadha Paandu
- Pitha Silethuma Paandu
- Sannivadha Paandu

As per "**Jeeva Rakshamirtham**"

- Vaadha Paandu
- Pitha Paandu
- Silethuma Paandu
- Thirithosa Paandu
- Nanju Paandu
- Miruthiga Paandu
- Alimuga Paandu[29]

As per **" Kandasamy Mudaliyar's Vaidhiya Sara Sangiraham"**

- Vaadha Paandu
- Pitha Paandu
- Moola Paandu
- Moola Pitha Paandu
- Visha Paandu[30]

As per "**Seetharamprasath Anubava Vaithiya Ragasiyam**"

- Vaadha Paandu
- Pitha Paandu
- Silethuma Paandu
- Thirithosa Paandu
- Nanju Paandu[31]

As per " **Kannusami's Chikicha Rathina Deepam**"

- Vaadha Paandu

- Pitha Paandu
- Silethuma Paandu
- Vida Paandu
- Paithiya Paandu[32]

As per "**Pararasa sekaram**"

- Vaadha Paandu
- Pitha Paandu
- Silethuma Paandu
- Vida Paandu
- Miruthiga Paandu[21]

As per **"Agasthiyar Gunavaagadam**"

- Vaadha Paandu
- Pitha Paandu
- Silethuma Paandu
- Vida Paandu
- Miruthiga Paandu[27]

As per "**Sarabendrar Vaithiya Muraigal**"

- Vaadha Paandu
- Pitha Paandu
- Silethuma Paandu
- Sanni Paatha Paandu
- Manthindrathaal Erpatta Paandu[33]

MUKKUTRA VERUPAADUGAL

As per Agasthiyar Gunavaagadam, Ranjaga pitham is responsible for production of blood and gives colour. Due to nutritional defect Ranjaga pitham gets deranged and leads to Pitha paandu noi. [23]

There will be loss of body strength with anorexia. The food ingested will not be digested properly. In view of these there will be defective hemopoiesis. Ranjaga pitham which impart colour to the skin also become hypovolemic and the pitha

thodam gets aggravate as a result the activities of other thodams gets affected adversely and aggravates the disease. In addition, swelling of the body will also occur. (34)

CURABLE AND INCURABLE DISEASES

Those types of anaemias where uncontrolled vomiting or diarrhoea, excessive oedema of the body, excessive thirst, hiccup and cough develop are cannot be easily cured. In addition, toxic anaemia is also not easily curable disease.(35)

NAADI NADAI

Naadi is the oldest diagnostic tool handled by siddhars. It is divided into Vaadha , Pitha , and Kapha . Its normal ratio is 1:1/2:1/4. Any variation in these is the sign of diseases.

In Azhal veluppu noi two types naadi are felt:

- Pitha Vaadha Naadi
- Kabha Pitha Naadi

“சிறப்பான பித்தத்தில் வாத நாடி
சேரிலுறு தாதுநட்ட முதர பீடை
உறைப்பாகச் செரியாமை குன்மஞ்சூலை
யுற்ற சுரங்கிராணி வயிற்றிரைச்சல் மந்தம்

அறைப்பான ஓங்கார புறநீர்க்கோவை
ஆயாசமிரக்க மொடுமயக்க மூர்ச்சை
முறைகாய்வு விடவீக்கம் மூலவாய்வு
முரடான நோய் பலவுமுடுகும் பண்பே”

“இடமான சேத்துமத்தில் பித்த நாடி
எழுந்தனுகில் விடமுடனே வீக்கமுண்டாம்
திடமான குளிர்காய்ச்சல் மஞ்சள் நோவுந்

தேகத்திலுளைச்சலிளைப் பிருமல் வாந்தி

விடமான நெஞ்சடைப்பு சுவாசம் விக்கல்

வெகுசுரமும் நாவறட்சி பாண்டுரோகம்

அடமான குவளைரத்த மதிசாரந்தான்

அணுகிவெகு பலநோய்க்கு தடங்கண்டாயோ"(36)

"குதித்திடும் வாதநாடி கூடிடும் பித்தத்தோடே

தத்தியே நடக்குமாகில் சரீரமே மெத்துவற்றி

மெத்தவே வாய்நீரொறி மேனியும் வெளுத்துக்காணும்

பித்தபாண்டு ரோகமென்று பேசினார் சூதாய்த்தானே"

ASATHIYA KURIKUNANGAL:

As per Kannusamiyam the oliguria and diarrhea persist in Paandu Noi leads to delayed prognosis.

"பாண்டு பிரமேகம் பன்வாத சூலைகுன்மம்

வேண்டா சயஞ்சன்னி வெண்சோவை நீண்ட

அதிநீரே காமாலை யானபிணி தம்முள்

அதி சாரமாகா தறி"(37)

Increased sexual desire and increased intake of pitha foods in paandu noi will leads to Kaamalai.

"விளம்பவே பாண்டு முற்றியிருக்கும் போது

மீறியே பித்த வஸ்துதனைப் புசித்தால்

புளம்பவே மங்கையுடன் புணர்ச்சி செய்தால்

பூண்டிடுமே காமாலை யென்னும் ரோகம்"(38)

PINIYARI MURAIMAI (DIAGNOSIS)

Diagnosis is based upon three main principles. They are

- Poriyal Therthal
- Pulanal Therthal
- Vinaathal

Findings with respect to Pitha Paandu Noi

Pori, Pulanaal therthal

Mei:

Pallor of skin, Mild yellowish discolouration of skin, Koilonychia.

Naa:

Pallor of tongue, Glossitis, Angular stomatitis.

Kan:

Pallor of conjunctiva

ENVAGAI THERVUGAL:

- Naa
- Niram
- Mozhi
- Vizhi
- Malam
- Moothiram
- Sparisam

GENERAL FINDINGS:

Naa:

Size, movements, colour, salivary secretion, inflammation, taste changes, deviation and ulceration of tongue is noted.

Niram:

Colour of skin is noted if any pallor, cyanosis yellowish discolouration, oedema is noted.

Mozhi:

Whether any high pitched, low pitched or sound like any instruments character of speech is noted.

Vizhi:

Colour, eyeball movements, vision, lacrimation, ulceration and paleness of lower eyelids and discolouration of conjunctiva are noted.

Malam:

Colour, odour, consistency, bulk, nature of faeces

Moothiram:

Colour, odour, volume and froth are considered

Sparisam:

Temperature, pain and nature of skin is noted

FINDINGS IN PITHA PAANDU NOI:

Naa - pallor, bitter taste, glossitis, stomatitis

Niram – the natural colour becomes pale or diminished

Mozhi – normal pitch

Vizhi – pallor of conjunctiva , dimness of vision

Malam – normal defaecation or constipation

Sparisam – normal temperature, sometimes hypothermia, dry skin

Naadi – pitha vaatham or kapha pitham

Moothiram – sometimes oliguria

In moothiram, neerkuri and neikuri are examined.

Procedures for collecting urine samples

“அருந்து மாறிரதமும் அவிரோதமுமதாய்

அஂகல் அலர்தல் அகாலஊண் தவிர்ந்தழற்

குற்றளவருந்தி உறங்கி வைகறை

ஆடிக்கலசத் தாவியே காது பெய்

தொருமுகூர்த்தக் கலைக்குட் படுநீரின்

நிறக்குறி நெய்க்குறி நிருமித்தற் கடனே”

-Noi Nadal Noi Muthal Nadal Thirattu.[39]

CHARACTERS OF URINE:

It has got five main characters

- Niram – colour
- Edai - weight
- Manam - odour
- Nurai – froth
- Enjal – sediments

ENJAL ILAKKANAM IN PAANDU NOI:

Oliguria of unknown cause and oliguria irrespective of increased intake of water paves way for Paandu Noi

NEIKURI:

“நிறக்குறிக் குரைத்த நிருமாண நீரிற்

சிறக்க வெண்ணெய்யோர் சிறுதுளி நடுவிடுத்

தென்றுறத் திறந்தொலி ஏகாதமைத்ததி

னின்றதிவலை போம் நெறிவிழியறிவும்

சென்றது புகலுஞ் செய்தியை யுணரே”

-Noi Nadal Noi Mudhal Nadal Thirattu.(40)

After collecting the sample urine in a bowl is placed in sunlight. Then a drop of oil is draped into it carefully without any shake. Note the shape of the spreading oil is observe

“அரவென நீண்டில் வாதம்

ஆழிபோல் படரில் பித்தம்

முத்தொத்து நிற்கில் மொழிவதென் கபமே”

-Noi Nadal Noi Mudhal Nadal Thirattu.(41)

Vaatha disease – oil drop spreads out like a snake

Pitha disease - oil drop spreading looks like ring shape

Kabha disease- oil drop stays like pearl without spreading

NEIKURI IN PAANDU NOI:

The neikuri observed in paandu noi patients shows ring like structure. Because the prime cause for disease is the increase in pitha kutram.

UYIR THATHUGAL:

Three vital forces are necessary in proper ratio for the normal functioning of body. They are

1. Vaatham
2. Pitham
3. Kabham

VAATHAM:

It is divided into 10 types. Its normal function and its variations in pitha paandu noi are described below as per in Siddha text.

S.NO	TYPES OF VAATHAM	FUNCTIONS	VARIATIONS IN DISEASE
1.	Piranan (Uyirkkaal)	Responsible for function of respiratory system and for tissue nutrition	Affected due to breathlessness or dyspnoea
2.	Abhanan (Kizhnokkukaal)	Responsible for excretary system for normal evacuation of bladder and bowels also concerned with Mensturation and ejaculation of sperm.	Affected in case of constipation and Menorrhagia.
3.	Viyaanan (Paravukaal)	Responsible for function of nervous system as neuro chemical transmission, innervations of organs and also for locomotor activity	Affected because of pallor of skin.
4.	Uthaanan (Melnokkukaal)	Responsible for reflexes such as cough, sneezing, vomiting and speech	Affected because of nausea.
5.	Samaanan (Nadukkaal)	Essential for proper digestion,assimilation and carries the digested nutrients to each and every organ.	Affected because of loss of appetite and anorexia.
6.	Naagan	Responsible for higher intellectual functions, opening and closure of eyes.	Generally not affected
7.	Koorman	It acts through facial nerve, responsible for opening and closing of eyes, normal	Affected because of dullness of vision

		vision, yawning and lacrimal secretion	
8.	Kirukaran	It produces nasal and salivary secretions, stimulates appetite, sneezing and cough.	Affected in cases of loss of appetite
9.	Devadhathan	Responsible for malaise, fatiguability and asthenia, emotions, anxiety and depression	Affected in case of insomnia
10.	Dhananjeyan	Resides in the cranium and produces bloating of the body after death. This leaves from the body after 3 days of death, forming a way through the skull.(42)	-

PITHAM:

S.NO	VARIETIES	SITUATION	FUNCTION	VARIATION IN DISEASE
1.	Paasagam(Anilapitham)	Between stomach and intestine	It gives appetite and helps digestion	Affected because of loss of appetite and anorexia.
2.	Ranjagam	Stomach	It is responsible for RBC formation and gives red colour to blood	Affected because of paleness
3.	Saathagam	Heart	Controls whole body	Affected because of difficulty in

				working
4.	Aalosagam	Eyes	Brightens eye faculty of vision	Affected because of dimness of vision
5.	Praasagam	Skin	Gives complexion to skin. (43)	Affected because of pallor and dryness

KABHAM:

S.NO	VARIETIES	SITUATION	FUNCTION	VARIATIONS
1	Avalambagam	Lungs	It helps in functioning of other kabhams and pumping heart.	Affected because of dyspnoea on exertion.
2.	Kilaethagam	Stomach	It moistens food stuffs and helps in digestion	Affected because of indigestion
3.	Pothagam	Tongue	Helps to recognize taste	Affected because of bitter taste in tongue
4.	Tharpagam	Head	Gives cooling sensation to body	Normal
5.	Santhigam	Joints	Helps in movement of joints by providing lubrication.(44)	Normal

UDAL THATHUKAL:

1.Saaram

2. Senneer

3. Oon
4. Kozhuppu
5. Enbu
6. Moolai
7. Sukkilam /Suronitham

These are the seven udal thathukal elements building the human body whose normal function is essential for our well being. Any deviation in these leads to pathological conditions.

S.NO	THATHUKAL	CHARACTERS	VARIATIONS
1.	Saaram	It gets separated from food and nourishes the body	Affected because of anorexia and indigestion
2.	Senneer	Responsible for existence of knowledge, strength, glory and blood component.	Affected because of pallor of skin and conjunctiva
3.	Oon	Moulding the shape of the body and muscles.	Affected because of anorexia and malabsorption.
4.	Kozhuppu	Acts as lubrication for the functioning of organs and provides a cover for the body.	Generally not affected
5.	Enbu	Structural unit of body and responsible for shape of body.	Generally not affected
6.	Moolai	It represents the bone marrow and strengthens the bone.	Generally not affected
7.	Sukkilam/suronitham	Helps in reproduction.[45]	Affected because of Amenorrhoea / Menorrhagia

KAALAM:

It refers to the position of the sun in the year is divided into six seasons.

S.NO	POZHUTHUGAL	MUKKUTRA VERUPAADUGAL
1.	Kaar kaalam (mid -avani & mid-puratasi)	Vatham - Vetrunilai valarchi Pitham - Thannilai valarchi
2.	Koothir kaalam (mid-iypasi & mid-karthigai)	Vatham - Thannilai valarchi Pitham - Vetrunilai valarchi
3.	Munpani kaalam (mid-margazhi & mid- thai)	Pitham - Thannilai valarchi
4.	Pinpani kaalam (mid-maasi & mid-panguni)	Kabham- Thannilai valarchi
5.	Elavenil kaalam (mid-chithirai & mid-vaikaasi)	Kabham - Vetrunilai valarchi
6.	Mudhuvenil kaalam (mid- aani & mid- aadi)	Vatham - Thannilai valarchi.(46)

RELATION BETWEEN MUKKUTRAM, KAALANGAL AND THINAIGAL:

Mukkutram	Thannilai vazharchi (accumulation)	Vetrunilai vazharchi (aggravation)	Thannilai adaithal (alleviation)	Thinai
VATHAM	Muthuvenil kaalam	Kaar kaalam	Koothir kaalam	Neithal
PITHAM	Kaar kaalam	Koothir kaalam	Munpani kaalam	Mullai
KABHAM	Pinpanikaalam	Elavenilkaalam	Mudhuvenil kaalam	Kurinji

VERUPADUTHI KANITHAL (DIFFERENTIAL DIAGNOSIS):

The following conditions are taken into account for arriving at final diagnosis of pitha paandu noi with the symptoms manifested in the respective conditions.

VAADHA PAANDU NOI:

SIGNS AND SYMPTOMS:

- Lower abdominal colic pain
- Thirst
- Anorexia
- Dryness of skin
- Constipation
- Rigor
- Pallor of body.

IYA PAANDU NOI

SIGNS AND SYMPTOMS

- Pallor of skin
- Salty taste of tongue
- Vomiting
- Sneezing
- Hoarseness of voice
- Cough
- Fatigue
- Oligospermia

NANJU PAANDU NOI:

SIGNS AND SYMPTOMS:

- Pallor of body
- Thirst
- Loss of taste
- Dyspnoea
- Anorexia
- Vomiting

DIET:

- Easily digestable food with Iron content is preferred.
  - Karisalai, Ponnanaganni, Sirukeerai, Araikeerai, Murungai keerai.
  - Kathiripinju, Avarai pinju, Murungai pinju, Vazhai katchal
- In severe cases with anorexia and indigestion only kanji and soups are advised.
- Easily digestible foods such as rice gruel and soups should be given.
- To improve general health Kaadai, Gowthari, Udumbu, Vellatukari are included in diet.
- Regular intake of Dates, Fig , Citrus fruits like orange is must.
- Liver of Goat, its bone and stomach, Fish and Egg yolk can be given.
- Wheat, Green leafy vegetables and Oats are rich in iron.
- Soups of bones and meat is advised.
- In case of oedema Neermulli keerai, Vazhai thandu can be given.

PATHIYAM:

The food which is sour and bitter taste should be strictly avoided.

- Agathi
- Pagal
- Pugaiyilai

Madhu should be avoided during the treatment.

MODERN ASPECT

MODERN ASPECT

BLOOD:

Blood is a connective tissue in fliud form. It is called "**fluid of health"** due to protection of body against the diseases and get rid of the waste products and unwanted substances by transporting them to the excretory organs like kidneys. The blood is a specialized body fluid that supplies essential substances and nutrients like sugar, oxygen and hormones to the cells. Blood is five times more viscous than water due to red blood cells and plasma proteins.[47]

COMPOSITON OF BLOOD:

Blood consists of a solid portion and a fluid portion. The solid portion constitutes the blood cells called red blood cells, white blood cells and platelets and the fluid portion is the plasma. The plasma contains 90% water and 10% solids . Blood makes up about 8% of the human body weight .The normal blood is slightly alkaline in reaction. The pH of blood is 7.3 or 7.4 due to the presence of bicarbonates and alkaline phosphates. The pH of blood is regulated by buffer systems in the blood, renal mechanisms and respiratory mechanism.

FUNCTIONS OF BLOOD:

Transport of nutrients, waste products, blood and respiratory gases

- Immune function.
- Storage function.
- Regulation of water balance.
- To maintain homeostasis of water, ions or Ph.
- Transport of Hormones and Enzymes.
- Distribution of heat throughout the body.
- Blood clotting.
- Temperature regulation.
- Communication- hormones distributed to all part of the body.
- Defensive function.
- Regulates blood pressure.

ERYTHROCYTES OR RED BLOOD CORPUSCLES:

RBC or Erythrocytes form one of the important constituent of the blood. The cytoplasm of the RBC contains special pigmented protein called haemoglobin (Hb) which forms 90% of the weight of erythrocytes. Red cells are biconcave discs having a mean diameter of about 7.8 micrometers and thickness of 2.5 micrometer. The average volume of the red blood cell is 90 to 95 cubic micrometers.

Normal range of red blood cell count in

Adult Males - 5 millions/cu. mm of blood.

Adult Females - 4.5 millions/cu.mm of blood.

ERYTHROPOIESIS:

The process of formation of RBC is called Erythropoiesis. The formation of red blood cells from stem cells in bone marrow regulated by the hormone erythropoietin from the kidneys. It is stimulated by decreased oxygen in circulation, regulated by the hormone erythropoietin responsible for erythropoiesis.

SITES OF RBC PRODUCTION:

Early weeks of embryonic life - Nucleated RBCs- Yolk sac .

Middle trimester of gestation - Liver form blood cells

Last month of gestation and after birth - Red bone marrow

Most RBCs continue to be produced in the marrow of the membranous bones ,such as- Vertebra, Sternum and Ribs.

GENESIS OF BLOOD CELLS:

In the bone marrow are cells called pluripotentialhemopoietic stem cells,from which all the cells in the circulating blood are derived .The successive divisions of the pluripotential cells to form the different peripheral blood cells. As these cells reproduce, continuing throughout the life of the person, a portion of them remains exactly like the original pluripotential cells

and is retained in the bone marrow to maintain a supply of these, although their numbers do diminish with the age. The larger portion of the reproduce stem cells, differentiate to form the other cells. The early offspring still cannot be recognized as different from the pluripotential stem cells, they have already become committed to a particular line of cells and are called committed stem cells.

The different committed stem cells, when grown in culture, will produce colonies of specific types of blood cells. A committed stem cell that produces erythrocytes is called a colony-forming unit- erythrocyte, CFU-E is used to designate this type of stem cell. The colony- forming units that form granulocytes and moncytes have the designation CFU-GM.

Growth and reproduction of the different stem cells are controlled by multiple proteins called growth inducers. Four types of major growth inducers. One of these, interleukin-3, promotes growth and reproduction of all the different types of stem cells.

The growth inducers promote growth but not differentiation of the cells. This is the function of another set of proteins called differentiation inducers. Each of these cause one type of stem cell to differentiate one or more steps toward a final type of adult blood cell.

Formation of the growth inducers and differentiation inducers is controlled by factors outside the bone marrow. In the case of red blood cells, exposure of the body to low oxygen for a long period results in growth induction, differentiation and production of greatly increased numbers of erythrocytes.[48]

REQUIREMENTS FOR ERYTHROPOIESIS:

1.Metals - Cobalt and Manganese are required for red cell production.

2.Vitamins - Vitamin B12 and Folate are essential for bio-synthesis of nucleic acid.

Vitamin C, Riboflavin, Pyridoxine, Vitamin E are necessary for synthesis of red cells.

3. Aminoacids - Aminoacids comprise the globin component of haemoglobin.

4.Hormones - Erythropoietin plays a significant role in erythropoietic activity.

Androgens and Thyroxine plays an vital role in red cell production.

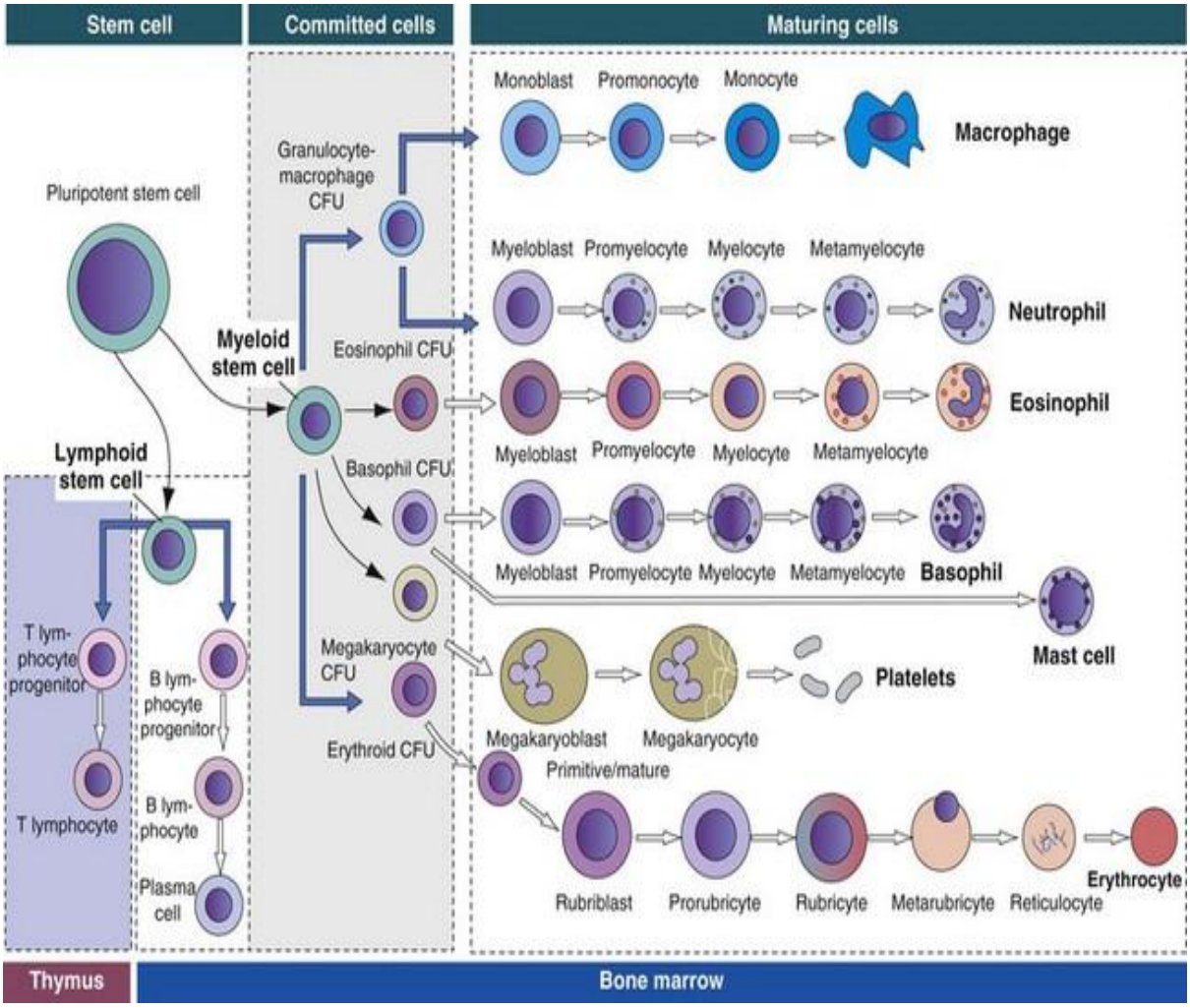
STAGES OF ERYTHROPOIESIS:

The red cells precursors are derived from pluripotent stem cells by a differentiation step. The first colonies to appear are small and consist of about 8- 16 cells, they are usually fully developed after a few days of incubation. After a longer period in culture large colonies or bursts appear the cells which give rise to the small colonies are called CFU-E (colony forming units, erythroid) and those which produce the 'burst' are called erythropoietin – dependent burst forming units or BFU-E.

In early foetus this process takes place in the mesodermal cells of yolk sac. By 3^{rd} - 4^{th} month it moves to liver. After 7 month it occurs in bone marrow. Erythropoiesis takes 4 days.

It consists of 7 stages:

STAGES OF ERYTHROPOIESIS



1. Proerythroblasts.

2. Basophilic erythroblasts (early normoblast) - haemoglobin synthesis begins in this stage.

3. Polychromatophil erythroblast (intermediate normoblast).

4. Orthochromatic erythroblast (late normoblast).

5. Erythrocytes.

6. Reticulocyte - A small number of reticulocytes are found in circulation.

7. Mature erythrocyte - There is lose of ribosomes in the final stage of maturation and these cells enter the circulation.

FACTORS NECESSARY FOR ERYTHROPOIESIS:

1. General factors

2. Maturation factors

3. Factors necessary for haemoglobin formation

GENERAL FACTORS:

Erythropoietin:

It is the most important general factor for Erythropoiesis. This is otherwise called Haemopoietin or Erythrocyte stimulating factor.

Source of secretion:

Erythropoietin is secreted by peritubular capillaries of kidney.

Stimulant for Secretion:

Hypoxia is the stimulant for the secretion of erythropoietin.

Actions of Erythropoietin:

Erythropoietin causes formation and release of new RBCs into circulation. After

secretion , it takes about 4 to 5 days to show the action.

1.Production of Proerytroblasts from stem cells in CFU-E of bone marrow.

2.Development of Proerytroblasts into matured RBCs.

3. Enter of matured Erythrocytes into blood.

Thyroxine :

General metabolic hormone thyroxine accelerates the process of Erythropoiesis at many levels.

Haemopoietic Growth Factors:

Interleukins are the growth factors. Interleukins induce the proliferation of pluripotent stem cells.

Vitamins:

Vitamin B,C,D,E are necessary for Erythropoiesis.

MATURATION FACTORS:

1.Vitamin B12:

This is otherwise called Extrinsic factor. It is essential for synthesis of DNA. Deficiency of Vit –B12 leads to failure in the maturation of the cell and reduction in the cell division. Cells are larger with fragile and weak cell membrane. Deficiency causes Pernicious anaemia.

2.Intrinsic factor of Castle:

It is produced in gastric mucosa and it is essential for the absorption of Vit-B12 from the intestine. In the absence of Intrinsic factor, Vit-B12 is not absorbed from the intestine. Deficiency of Intrinsic castle leads to Pernicious anaemia.

3. Folic acid:

Folic acid is essential for maturation. It is required for the synthesis for DNA. In the absence of Folic acid, the synthesis of DNA decreases causing maturation failure. This leads to anaemia in which the cells are larger and appear in

Megaloblastic (proerythroblastic) stage and anaemia due to Folic acid deficiency is called Megaloblastic anaemia .(49)

FUNCTIONS OF RBC:

1.RBC carry O2 and CO2

2.Maintaining acid balance of body and ionic equilibrium

3.Bile pigments formed from Hb are destroyed RBCs

DESTRUCTION OF RBC:

Red cells have a mean life span of 120 days, after which red cell metabolism gradually deteriorates as the enzymes are not replaced. The destroyed red cells are removed mainly by the macrophages of the reticulo endothelial system of the marrow, and to some extent by the macrophages in the liver and spleen. The breakdown of the red cell liberates iron for recirculation via plasma transferring to marrow erythroblasts, and protoporphyrin is broken down to bilrubin. Bilrubin circulates to the liver where it is conjugated to its diglucuronide which is excreted in the gut via bile and converted to sterocobilinogen and stercobilin excreted in the faeces. Part of sterocoblinogen and stercobilin is reabsorbed and excreted in the urine as urobilinogen and urobilin. (50)

HAEMOGLOBIN:

Haemoglobin consists of a basic protein, globin and the iron-porphyrin complex, Haem. The molecular weight of Haemoglobin is 68000. Normal adult haemoglobin consistutes 96-98% of total haemoglobin content and consists of four polypeptide chains. Most of the haemoglobin (65%) is synthesized by the nucleated red cell precursors in the marrow, while the remainder (35%) is synthesized at the reticulocyte stage. Synthesis of haem occurs largely in the Mitochondria. Protoporphyrin combines with iron supplied from the circulating transferring to form heam. Each molecule of haem combines with a globin chain synthesized by polyribosomes . A tetramer of four global chains constitutes the haemogoblin molecules.

IRON

It is present in Ferrous (fe++) form. It is unstable or loose form, under certain conditions, the iron may be present in Ferric state (fe+++) which is stable form.

PHORPHYRIN:

The pigment part of heme is called porphyrin. It is formed by four pyrole rings. The pyrole rings are attached to one another by methane bridges. The iron is attached to " N' of each pyrole ring and N of globin molecule.

GLOBIN:

It contains four poypeptide chains. Among the four polypeptide chains two are alpa chains and two are betachains.

SYNTHESIS OF HAEMOGLOBIN:

Synthesis of haemoglobin actually starts in pro-erythroblastic stage. It appears in the intermediate normoblastic stage only. Production of haemoglobin is continued until the stage of reticulocyte. Haem portion is synthesied in Mitochondria and protein part globin in Ribosomes.

TYPES OF HAEMOGLOBIN:

Haemoglobin can be broadly divided into normal and abnormal types.

Normal haemoglobins

1. Adult haemoglobin - Hb A
2. Fetal haemoglobin - Hb F (Major Hb in intrauterine life).
3. Embryonic haemoglobin - These are confined to the very early embryonic stages of development.

FACTORS NECESSARY FOR HAEMOGLOBIN FORMATION

Various materials are essential for the formation of haemoglobin in the RBCs. Deficiency of these substances decreases the production of haemoglobin leading to anaemia such factors are

1. First class proteins and aminoacids - Proteins of high biological value are essential for the formation of haemoglobin.

2. **Iron -** Necessary for the formation of haem part of the haemoglobin.

3. Copper - Necessary for the formation of haem part of the haemoglobin.

4. Cobalt and Nickel - Necessary for the utilization of iron during haemoglobin formation.

5. **Vitamins** - Vitamin C, Riboflavin, Nicotinic acid and Pyridoxine are essential for the formation of Haemoglobin.

ABNORMAL HAEMOGLOBIN DERIVATIVES:

It is formed by carbon monoxide poisoning or due to some drugs like nitrates and sulphonamides.

- Carboxyhemoglobin
- Methemoglobin
- Sulfhemoglobin[51]

DESTRUCTION OF HAEMOGLOBIN:

After the lifespan of 120 days, the RBC is destroyed in the reticulo endothelial system, particularly in spleen and the haemoglobin is released into the plasma. Haemoglobin degraded in the reticulo endothelial cells and split into globin and haem. Globin is utilized for resynthesis of haemoglobin. Haem is degraded into Iron and porphyrin. Iron is stored in the body as Ferritin.

HAEMOGLOBIN CONCENTRATION:

At birth HB concentration is about 33gm% by the end of the 3rd month, it will fall to below normal 10.5gm% then gradually it will brought up at the end of 1 yr HB content will be 12.5gm%.

The mean corpuscular HB content is 29 micro gram.

The MCHC% is about 35%.

Colour index = % of HB/% of RBC.

Hb content in blood is estimated by haemoglobinometer.

BLOOD INDICES:

The values of haemoglobin, PCV and total RBC count are used to calculate red cell volume and red cell haemoglobin content and concentration are called red blood cell indices. The commonly estimated blood indices are

1.Mean cell volume (MCV).

2.Mean cell haemoglobin (MCH).

3.Mean cell haemoglobin concentration (MCHC).

ABSOLUTE CORPUSCULAR VALUES:

1. Mean corpuscular volume (MCV) is the average volume of each RBC expressed in cubic microns.

   $$MCV = \frac{\text{vol. of erythrocytes in cc in 1000cc of blood}}{\text{RBC count per cmm in millions}}$$

   = 450/5 = 90 cubic microns (80-94).

2. Mean corpuscular haemoglobin content (MCH) is the average volume of haemoglobin in gram and volume of RBC in cubic microns.

   $$MCH = \frac{\text{haemoglobin in gram in 1000 cc of blood}}{\text{Volume of RBC in cubic microns}}$$

   =150/5 = 30 micro micro gram (30- 38)

3. Mean corpuscular haemoglobin concentration (MCHC)% is the amount of haemoglobin in 100cc of RBc expressed in %.

   $$MCHC = \frac{\text{haemoglobin in gram in 100 cc of blood} \times 100}{\text{PCV in 100 cc of blood}}$$

   =15×100/40 =1500/40=37.4% (30-38)

NORMAL VOLUME OF BLOOD INDICES:

Normal PCV :

In males: 40 to 45%

In females: 38 to 42%

Normal MCV: 78 to 90 cu. micron

Normal MCH: 27 to 32 pg

Normal MCHC: 30 to 38%

FUNCTIONS OF HB:

1.Transport of O_2 from lungs to tissues

2.Transport of CO_2 from tissues to lungs

3.Maintain acid base balance

4.Source of bilirubin.

ABNORMAL HAEMOGLOBIN DERIVATIVES:

It is formed by carbon monoxide poisoning or due to some drugs like nitrates and sulphonamides.

- Carboxyhemoglobin
- Methemoglobin
- Sulfhemoglobin

FATE OF HAEMOGLOBIN:

The haemoglobin released from the cells when they burst is phagocytized almost immediately by microphages in many parts of the body but especially in the liver, spleen and bone marrow. During the next few hours to days, the macrophages release the iron from the haemoglobin back into the blood to be carried by transferrin to the bone marrow for production of new red blood cells or to the liver and other tissues for storage in the form of Ferritin.

Theporphyrin portion of the haemoglobin molecule is converted by the macropages, through a series of stages, into bile pigment bilirubin.

IRON METABOLISM:

Iron is an essential mineral and important component of protein, involved in oxygen transport. Iron is important for the formation of haemoglobin and myoglobin. It is also necessary for the formation of other substances like cytochrome, cytochrome oxidase, peroxidise and catalase. The main functions of iron are,

1. Transport of oxygen to the tissues
2. Participation in cellular oxidation mechanism

ABSORPTION OF IRON:

Iron is absorbed mainly from the small intestine. Bile is essential for the absorption of iron. Iron is present mostly in Ferric (Fe3) form. It is converted into ferrous form which is absorbed into the blood. Soluble ferric iron is converted into ferric iron by the enzyme ferric reductase in the presence of hydrochloric acid. In the blood ferric iron is converted into ferrous iron and transported. A peculiar feature of Iron metabolism is that, only a small part of the dietary iron is absorbed under normal conditions because the body has the limited capacity to excrete iron.

TRANSPORT OF IRON:

Iron combines with a beta globulin called apotransferrin resulting in the formation of transferrin and iron is transported in the form of transferring. Transferrin is the main form in which iron is transported in the blood and iron in transferring is in the ferric form. Iron combines with globin and released easily at any region in the body. Ferritin is the chief storage form of iron and is present in gastrointestinal mucosa, bone marrow, liver and spleen.[52]

DAILY REQUIREMENT OF IRON:

Adult male : 0.5-1mg

Adult female : 1-2mg

Infants : 60µg/kg

Children : 25µg/kg

Pregnancy women: 3 – 5mg

Iron requirement(mg)=4.4× body weight× Hb deficit

DAILY LOSS OF IRON:

In males about 1mg of iron is excreted through faeces. In females amount of iron loss is very high due to menstruation. In females, during every menstrual cycle, about 50 ml of blood is lost by which 25 mg of iron is lost.

ANAEMIA

Anaemia is defined as a condition in which haemoglobin level is below the normal range for patients age and sex. According to WHO Anaemia is a condition in which the number of red blood cells or their oxygen-carrying capacity is insufficient to meet physiologic needs, which vary by sex, age, altitude, smoking. In general, reduction of haemoglobin is associated with fall in erythrocyte count and packed cell volume. Iron, Vitamin B12 and Folic acid are the three main deficiencies that cause anaemia.

Anaemia is derived from the Greek word means "lack of blood". It is the most common nutritional deficiency in the world. It occurs when the red blood cells do not carry enough oxygen to the tissues of the body due to

- Decreased production of RBC.
- Increased destruction of RBC.
- Excess loss of blood from the body.

For Adults normal haemoglobin ranges (Males) - 13.0 g/dl

Females - 11.5 g/dl

Anaemia can be caused by the defective production of red cells or an increased rate of loss of cells, either by bleeding or premature destruction (haemolysis).

The causes of defective production of red cells include

1) Deficiency of Iron, Vitamin B12 or Folate.

2) Anaemia of chronic disorders.

3) Reduced erythropoietin production - chronic kidney disease.

4) Primary diseases of bone marrow.

CAUSES OF ANAEMIA:

1. Inadequate supply of nutrients resulting in deficiency of anaemias (iron ,vitamins and proteins deficiency).

2. Aplasia of bone marrow.

3. Anaemia associated with chronic diseases.

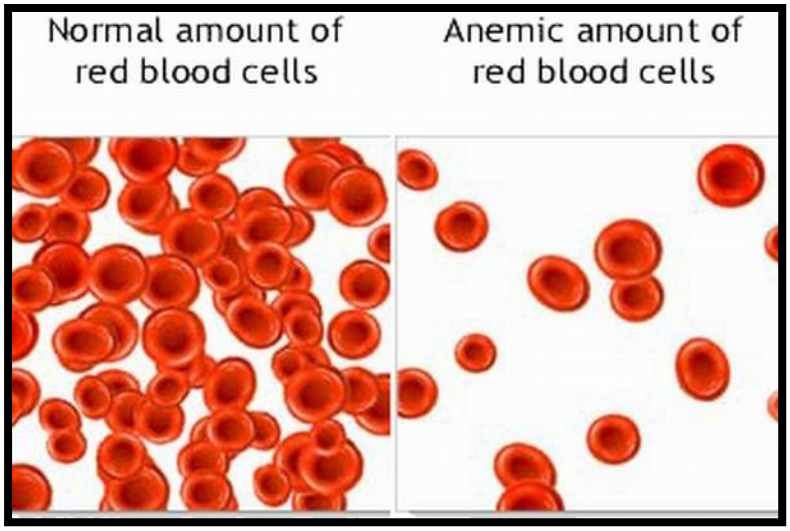
4. Anaemia associated with renal failure.

5. Anaemia due to inherited diseases.

6. Anaemia due to blood loss.

RED BLOOD CORPUSCELLS

NORMAL AND ANAEMIC AMOUNT OF RBC



MAIN FACTORS:

The haemoglobin level at which symptoms and signs of anaemia develop depends upon 4 main factors.

1.The speed of onset of anaemia

2.The severity of anaemia

3.The age of the patient

4.The haemoglobin dissociation curve.

SIGNS:

1. Pallor of face, mucous membranes, conjunctiva and skin.

2. Cardio vascular system - Tachycardia, cardiomegaly, dysnoea on exertion, congestive heart failure.

3. Central nervous system - Faintness, giddiness, headache, tinnitus, drowsiness, numbness and tingling sensations of the hands and feet.

4. Reproductive system - Menstrual disturbances such as Amenorrhoea, Menorrhagia and loss of libido.

5. Renal system - Mild proteinuria and impaired concentrating capacity of the kidney occur in severe anaemia.

6. Gastro intestinal system - Anorexia, flatulence, nausea, constipation and

weight loss.[53]

CLASSIFICATION OF ANAEMIA:

1. Anaemia due to blood loss

- Acute blood loss
- Chronic blood loss

2. Anaemia due to impaired cell formation.

3. Anaemia due to increased red cell destruction.

Based on the red cell size, haemoglobin content and red cell indices, anaemias are classified into 3 types

1. Microcytic, hypochromic: MCV, MCH, MCHC are all reduced.

2. Normocytic, normochromic: MCV, MCH, MCHC are all normal.

e.g. In acute blood loss, haemolytic anaemias, anaemia of chronic disorders

3. Macrocytic anaemia: MCV is raised.

e.g. In megaloblastic anaemia due to vitamin B12 or folic acid.

Based on etiology, anaemia is divided into five types

1. Haemolytic anaemia.

2. Haemorrhagic anaemia.

3. Nutrition deficiency anaemia.

4. Aplastic anaemia.

5. Anaemia of chronic diseases.[54]

IRON DEFICIENCY ANAEMIA:

The most commonest nutritional deficiency disorder throughout the world is Iron deficiency anaemia. It develops when the supply of iron is inadequate for the requirement of haemoglobin synthesis. The development of Iron deficiency depends upon the following factors:

1. Increased blood loss

2. Increased requirements

3. Inadequate dietary intake

4. Decreased intestinal absorption.

Hypochromic anaemia due to iron deficiency is the commonest cause of anaemia throughout the world. It is estimated that about 20% of women in child bearing age group are anaemic and in adult males is about 2%. In this type all the three red cell

indices (MCV, MCH and MCHC) are reduced and occurs due to defective haemoglobin synthesis. Hypochromic anaemias are classified into two groups.

1. Hypochromic anaemia due to iron deficiency.

2. Hypochromic anaemia other than iron deficiency.

ETIOLOGY:

1) Increased physiological requirements:

a) Growth – iron deficiency anaemia.
b) Menstruation – anaemia common in adult menstruating women
c) Preganancy – in pregnancy it is common in world wide.

2) Pathological blood loss:

a) Mennorhagia – also antepartum and post partum bleeding.
b) GI tract :
- Bleeding piles
- Aspirin , Indomethacin, Butazolidin and Corticosteroids
- Peptic ulcers
- Haemorrhoids
- Carcinoma of stomach
- Oesophagial varices
- Ulcerative colitis
- Hiatus hernia
- Gastro-intestinal surgery
- Intestinal infection and infestations – Ankylostomiasis, Amoebic or Bacillary infection.

c) Urinary tract:
- Recurrent haematuria
- Haemoglobinuria

d) Miscellaneous:
- Cirrhosis of liver,
- Hiasutus hernia
- Crohn’s disease

- Bleeding from gums
- Ulcerative colitis

e) Other causes:

- Regular blood donation
- Injuries and accidents
- Recurrent epistaxis
- Recurrent haemoptysis
- Idiopathic pulmonary haemosiderosis

3) Nutritional defect:

- Low intake of Iron rich diet
- Poverty inhibitors in diet

4) Poor absorption of iron:

- Achlorhydria
- Gastrectomy
- Coelic syndrome
- Geophagia[55]

CLINICAL FEATURES OF IRON DEFICIENCY ANAEMIA:

- Weakness
- Tachycardia
- Increased basal metabolic rate
- Fatigue
- Dyspnoea on exertion
- Dizziness
- Drowsiness
- Palpitation
- Pallor of skin, mucous membranes and sclera
- Loss of appetite
- Hair loss
- Fainting

- Pruritis
- Insomnia
- Dysphagia
- Menorrhagia
- Koiloncyhia (spoon shaped nails)
- Atropic glossitis
- Angular stomatitis
- Angina and congestive cardiac failure in older patients
- Plummer-Vinson syndrome
- Hepatosplenomegaly
- Pica.[56]

INVESTIGATIONS:

1. Blood count –

    - RBC count
    - Haemoglobin and haemocrit are decreased
    - MCV, MCH and MCHC are decreased.

2. Blood film –

    - Peripheral Smear shows hypochromia
    - Red cells are smaller in size.

3. Morphological changes-

    - Anisopoikilocytosis
    - Elongated 'pencil' cells , occasional polychromasia.
    - Hypochromic Microcystic and Normochromic Macrocystic
    - Red cell survival – decreased
    - Serum iron – decreased
    - TIBC – decreased
    - Serum Feritin concentration – levels of 10 mcg/1 or less in simple Iron deficiency anaemia.

- Bone marrow – Increased cellularity from increased haemopoietic activity. Absence or reduction in Iron granules in RE cells of the marrow.

TO DETERMINE THE CAUSE OF IRON DEFICIENCY ANAEMIA:

- **STOOL EXAMINATION:**

Occult Blood – negative test do not exclude intermittent bleeding or bleeding in the GI tract

- Bulky, Fatty stools
- Ankylostoma, Whip worm

- **X RAYS:**

Barium meal and smell, bowel examination and barium enema may show a GI disorder.

- **ENDOSCOPY:**

Proctoscopy for the detection of Piles.

Sigmoidoscopy, may reveal the lesions not shown by X rays.

- **JEJUNAL BIOPSY:**

If no source of blood loss is found, the celiac syndrome should be excluded by Biopsy.

- **IV UROGRAPHY:**

If haematuria

- Bones - Bone tenderness especially Sterna tenderness may occur.
- Breast - For evidence of carcinoma.
- Rectal examination - For Haemorrhoids or Rectal bleeding. Size and shape of Prostate gland.
- Pelvic examination - In Females with Menorrhagia.
- Fundus - Retinitis in Anaemia due to Chronic Renal Failure.

MANAGEMENT:

1. Correction of dietary deficiency:

    - Intake of iron rich diet.
    - Meats - beef, pork, lamb, liver and other organ meat.
    - Poultry - chicken, duck, turkey, liver.
    - Fish - shell fish, clams, oysters.
    - Leafy greens of the cabbage family, broccoli.
    - Legumes.
    - Yeast leavened whole wheat.

2. Correction of chronic alcoholism.

3. Removal of toxic chemical agent or drug in haemolytic anaemia.

4. Blood transfusion.

5. Haematinic should be given in adequate dose for sufficient period of time.

6. The haematinic should be given in adequate doses for a sufficient period of time.

7. Treatment of underlying cause - Ankylostomiasis, Piles, Menorrhagia, Leukemia, Liver diseases, Endocrine deficiency, Chronic renal failure.

TRIAL DRUG

TRIAL DRUG

DRUG NAME:

SARAKONDRAI CHOORANAM.

INGREDIENTS:

Sarakondrai leaves and flowers.

SOURCE OF DRUG:

The required fresh flowers and leaves are procured from Govt Siddha Medical College Campus . Then the plant was identified and authenticated by the concerned Botanist of Govt Siddha Medical College, Chennai.

STANDARD OPERATIVE PROCEDURE:

Fresh samples are collected and they are dried in shade. After that they are finely powdered and kept in an air tight container.

DOSE: 2 gm twice a day

ADJUVANT: Milk

INDICATION:

PAANDU

REF – Athmaratchamirtham Ennum Vaithya Sara Sangraham.(Page no:598).[57]

DRUG STORAGE:

The trial drug is stored in clean dry air tight container and it is dispensed to the patients in packets.

ACTIVITY OF TRIAL DRUG

SARAKONDRAI:

Botanical Name - *Cassia fistula*

Family - Caesalpinaceae

Suvai - Thuvarppu, siru kaippu

Thanmai - Veppam

Pirivu - Karppu

Action - Laxative,Vermifuge.

CHEMICAL CONSTITUENTS:

Leaves and Flowers of *Cassia fistula* :

- Biflavonoids,
- Triflavonoids,
- Sennoside A and B,
- Chrysophanol,
- Kaempferol,
- Rhein,
- Fistulin,
- Triterpenes,
- Volatile oil,
- Procyanidin B2,
- Chrysophanic acid,
- β -Sitosterol

Gunam:

The flowers of Sarakondrai plant cures Vellai, Vettai, Paandu, Kamalai, Scabies, Eczema, Colic pain, Intestinal disorders and strengthening internal organs. [58]

TRIAL DRUG

SARAKONDRAI CHOORANAM

MATERIALS AND METHODS

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PROTOCOL

The disease Pitha Paandu noi has been described in the text Yugi Vaithiya Chinthaamani.

STUDY DESIGN:

A clinical study was carried out in the Post Graduate Department of Pothu Maruthuvam, Govt Siddha Medical College attached to Arignar Anna Hospital, Chennai, during the period of 2015 to 2017.

The study was approved by **Institutional Ethics Committee (IEC)** and the approval number is **GSMC-CH-ME-4/2015/011**. It was registered in **Clinical Trials Registry - India** (**CTRI)** and the registration number is **CTRI/2017/06/008735.**

POPULATION AND SAMPLE:

The population consists of all patients who were attending the OPD of Arignar Anna Hospital, Arumbakkam, Chennai. Sample consists of Pitha paandu patients who satisfying the Inclusion and Exclusion criteria mentioned below.

SAMPLE SIZE:

40 patients of both the sexes of age groups between 18 – 50 yrs suffering from Pitha paandu noi were treated.

CRITERIA FOR SELECTION:

The patients were subjected to pre designed protocol comprising of following clinical manifestations.

INCLUSION CRITERIA:

- Pallor of conjunctiva, tongue, nails,
- Dimness of vision,
- Faintness,
- Glossitis,

- Angular stomatitis,
- Dyspnoea,
- Palpitation,
- Giddiness,
- Bitter taste in mouth,
- Fatigue,
- Lassitude,
- Anorexia ,
- Patients having HB below 10 gm
- Age between 18 – 50 yrs
- Worm infestations are selected for the study .

EXCLUSION CRITERIA:

- Age above 60 yrs
- HB above 10 gms
- (Clinical history)
- History of chronic Renal disorders
- History of chronic Liver disorders
- History of Thalessemia
- History of Bleeding disorder
- History of Myxoedema
- Vulnerable Populations such as Pregnant women, Lactating mothers, TB affected individuals, HIV positive.

HISTORY TAKING:

A detailed history of patients age, occupation, socio economic status, complaints and its duration, previous illness, personal habits, menstrual history are recorded in the case sheet for each and every patient at the time of admission. Special attention was paid to record any past history of blood loss, nutritional deficiency and worm infestation.

CLINICAL DIAGNOSIS:

The following parameters are followed for diagnosing the disease on the basis of Siddha system.

- Poriyaal arithal
- Pulanaal arithal
- Vinaathal
- Envagai thervugal
- Uyir thadhugal
- Udal thadhugal

These diagnostic tools are very useful in assessing prognosis of the disease during treatment.

LABORATORY INVESTIGATION:

BLOOD:

TC, DC, ESR, HB, MCV, PCV, MCH, MCHC, RBC count, Blood Sugar, Urea and Cholesterol.

URINE:

Albumin , Sugar, Deposit.

MOTION:

Ova, cyst and occult blood.

TRIAL MEDICINE AND DOSE:

SARAKONDRAI CHOORANAM – 2gm bd with milk after food.

RESULTS AND OBSERVATION

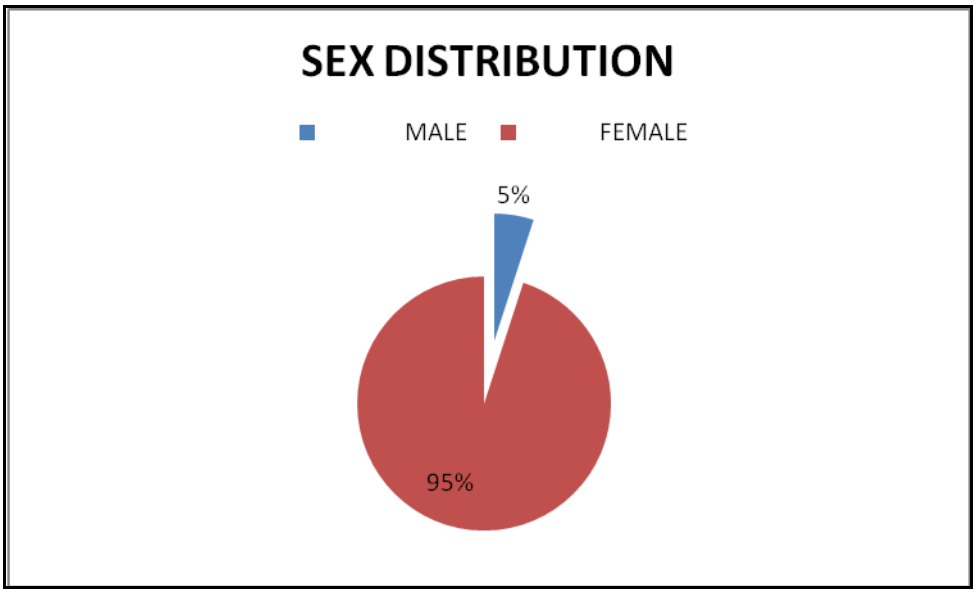
RESULTS AND OBSERVATION

A total number of 40 patients included in the study with signs and symptoms of Pitha Paandu were treated in the outpatient Department of Pothu Maruthuvam, Government Siddha Medical College, attached to Arignar Anna Hospital Chennai-106 during the period of 2015-2017. The results and observations were tabulated regarding the following features.

- Sex Distribution
- Age Distribution
- Kaalam
- Paruvakaalam
- Thinai
- Occupational status
- Socio economic status
- Food habits
- Aetiological factors
- Mukkutram- Vatham, Pitham, Kabam
- Ezhu Udal Kattugal
- Ennvagai Thervugal
- Neikuri
- Clinical Features and prognosis
- Assessment of results
- Haemoglobin level
- By laboratory investigation

1. SEX DISTRIBUTION

SEX	NO. OF CASES	PERCENTAGE
MALE	2	5%
FEMALE	38	95%

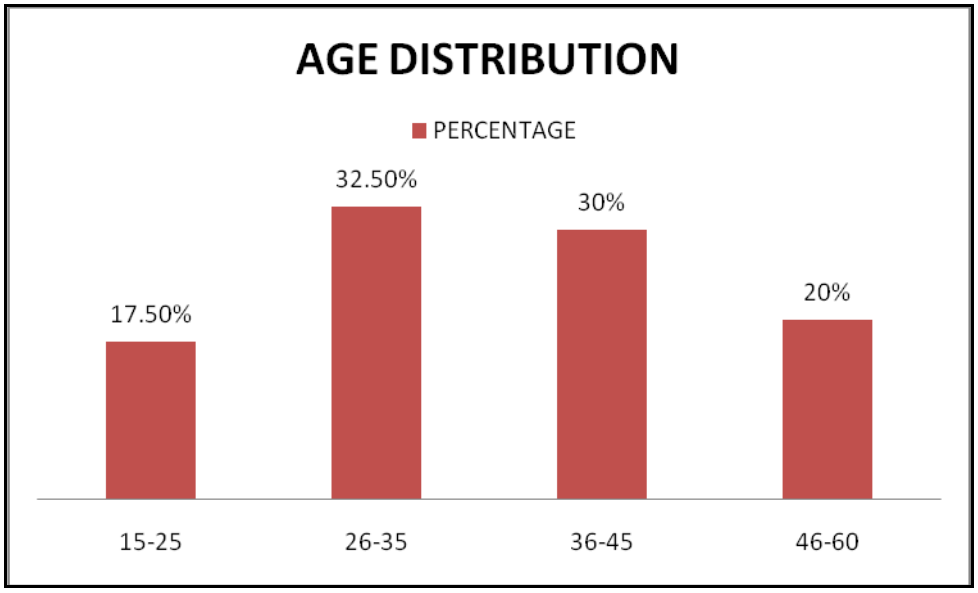


Inference:

Among 40 cases, 38 patients (95%) were females and 2 patients (5%) are males

2. AGE DISTRIBUTION

AGE IN YEARS	NO. OF CASES	PERCENTAGE
15-25	7	17.50%
26-35	13	32.50%
36-45	12	30%
46-60	8	20%

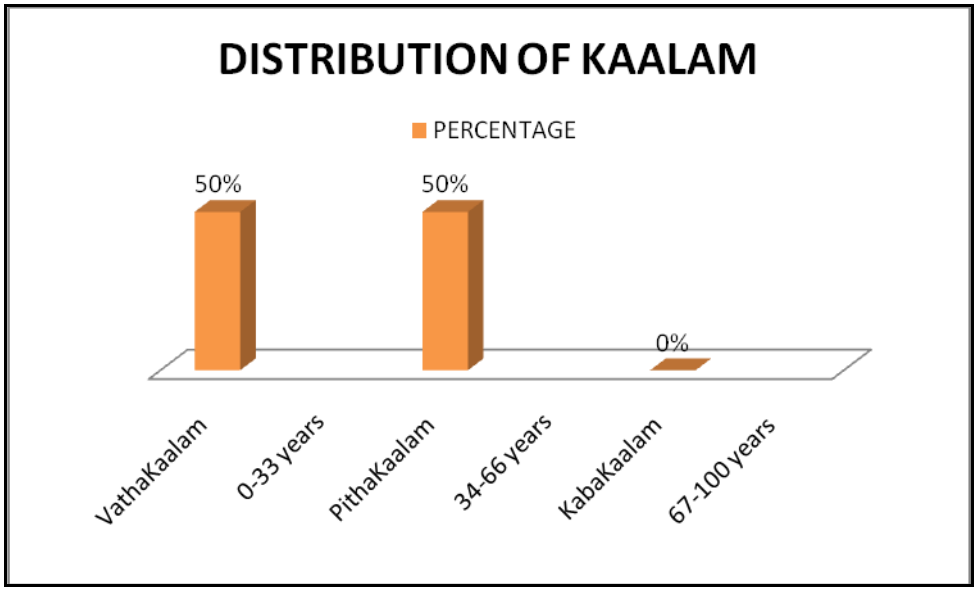


Inference:

Out of 40 patients, 13 patients (32.5%) are in the age group of 26-35, 12 patients (30%) are in the age group of 36-45, 8 patients (20%) are in the age of 46-60,7 patients (17.5%) are in the age group of 15-25.

3. DISTRIBUTION OF KAALAM

KAALAM	NO. OF CASES	PERCENTAGE
VathaKaalam 0-33 years	20	50%
PithaKaalam 34-66 years	20	50%
KabaKaalam 67-100 years	0	0%

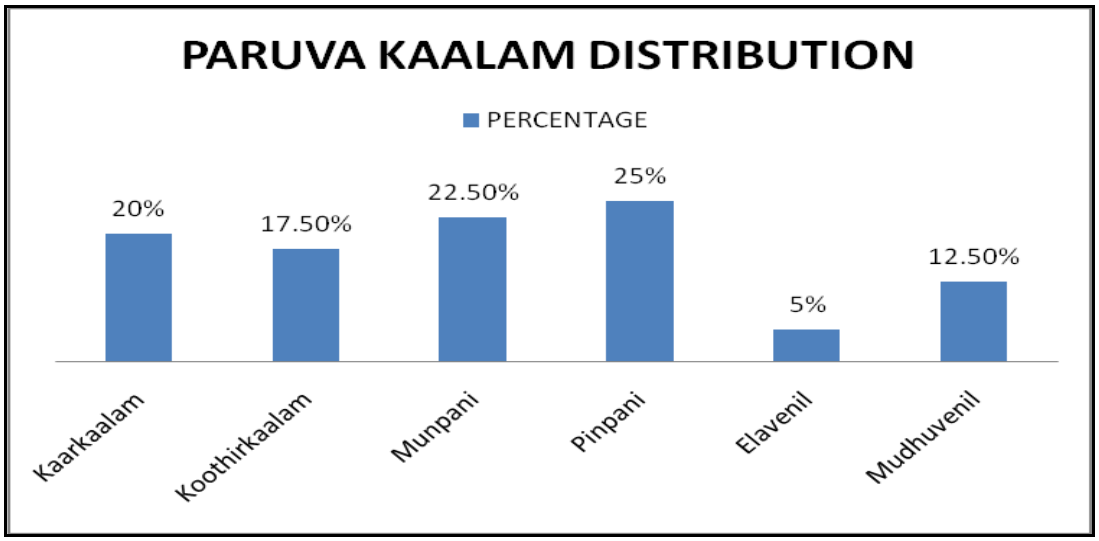


Inference:

Out of 40 patients, 20 patients (50%) comes under Vatha Kaalam and 20 patients (50%) comes under Pitha Kaalam.

4. PARUVA KAALAM DISTRIBUTION

PARUVA KAALAM	MONTHS	NO OF CASES	PERCENTAGE
Kaarkaalam	Avani, Puratasi, Mid Aug-Mid Oct	8	20%
Koothirkaalam	Iyppasi, Kaarthigai Mid Oct-Mid Dec	7	17.50%
Munpani	Margazhi, Thai Mid Dec-Mid Feb	9	22.50%
Pinpani	Maasi, Panguni Mid Feb-Mid April	10	25%
Elavenil	Chithirai, vaigasi Mid April- Mid June	2	5%
Mudhuvenil	Aani, Aadi Mid June-Mid Aug	5	12.50%

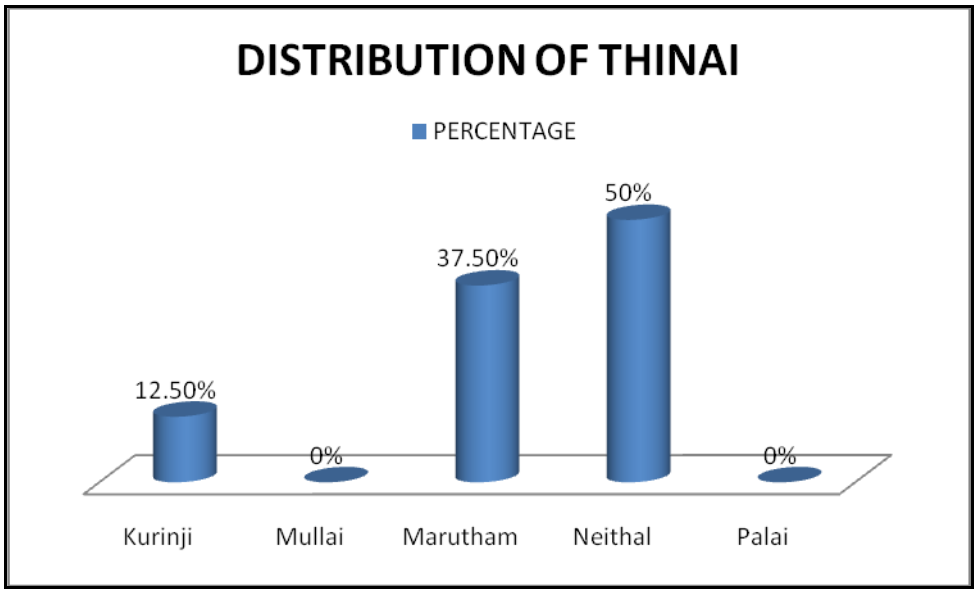


Inference:

Out of 40 patients,10 patients (25%) comes under Pinpani, 9 patients (22.5%) comes under Munpani, 8 patients (20%) comes under Kaarkalam, 7 patients (17.5%) comes under Koothir kaalam,5 patients (12.5%) comes under Mudhuvenil Kaalam and 2 patients (5%) comes under Elavenil kaalam.

5. DISTRIBUTION OF THINAI

THINAI	NO. OF CASES	PERCENTAGE
Kurinji	5	12.50%
Mullai	0	0%
Marutham	15	37.50%
Neithal	20	50%
Palai	0	0%

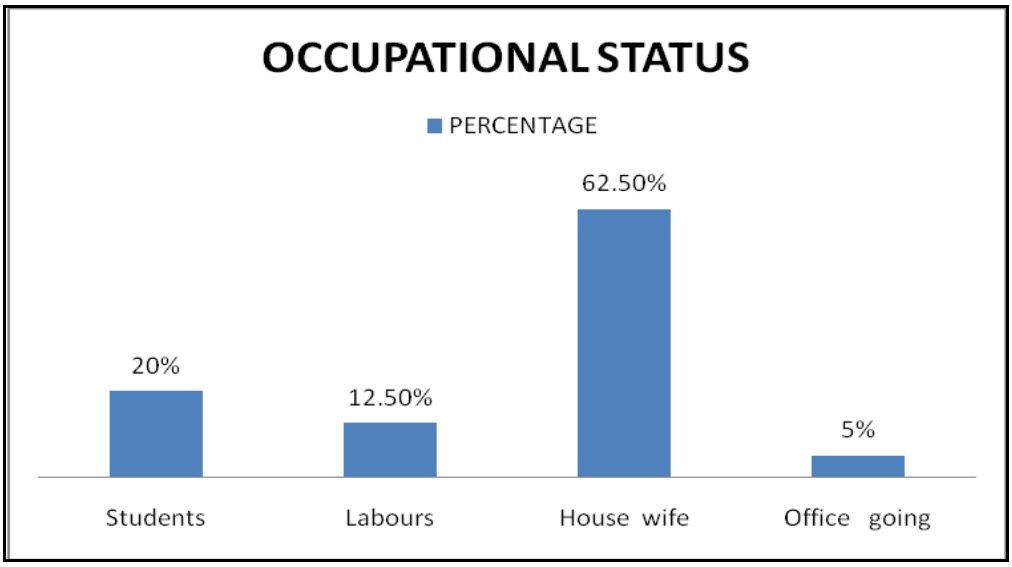


Inference:

Out of 40 patients 20 patients (50%) comes under Neithal, 15 patients (37.5%) comes under Marutham, 5 patients (12.5%) comes under Kurunji.

6. OCCUPATIONAL STATUS

OCCUPATION	NO. OF CASES	PERCENTAGE
Students	8	20%
Labours	5	12.50%
House wife	25	62.50%
Office going	2	5%

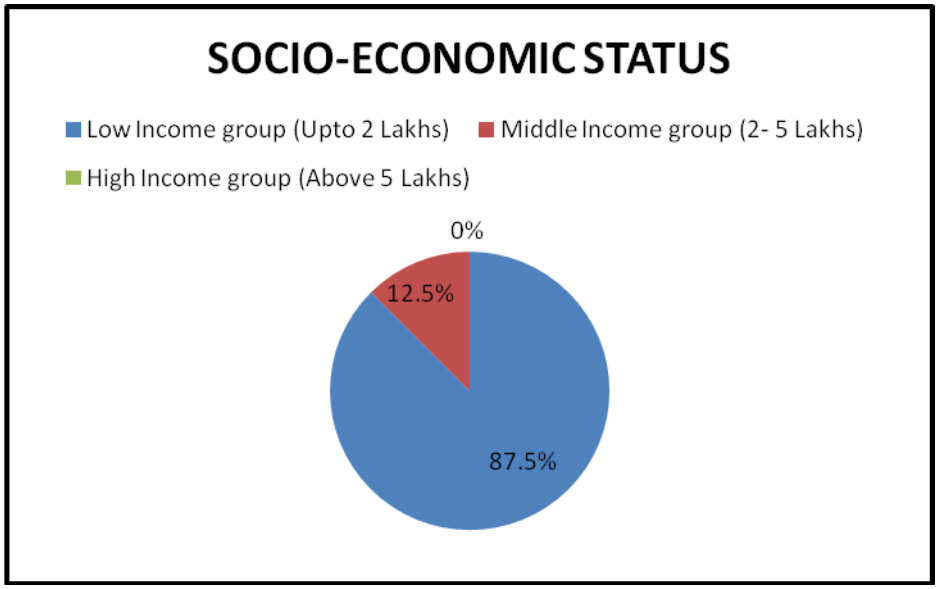


Inference:

Out of 40 patients, 8 patients (20%) were students, 5 patients (12.5%) were labours, 25 patients (62.5%) were house wifes and remaining 2 patients (5%) were office going.

7. SOCIO-ECONOMIC STATUS

INCOME/ANNUM	NO. OF CASES	PERCENTAGE
Low Income group (Upto 2 Lakhs)	35	87.50%
Middle Income group (2- 5 Lakhs)	5	12.50%
High Income group (Above 5 Lakhs)	0	0%

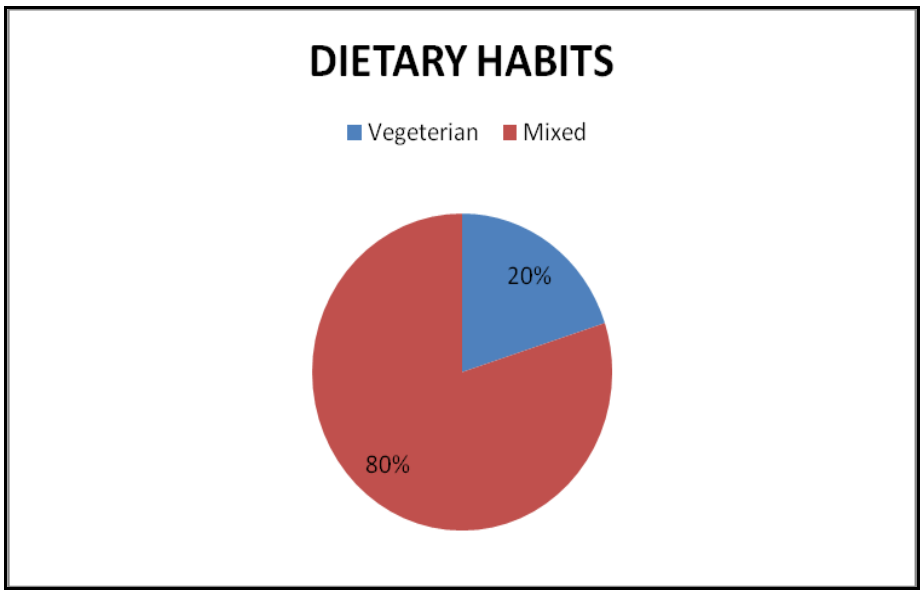


Inference:

Out of 40 patients 5 Patients (12.5%) belongs to middle income group , 35 Patients (87.5%) belongs to low income group.

8. DIETARY HABITS

DIETARY HABITS	NO. OF CASES	PERCENTAGE
Vegeterian	8	20%
Mixed	32	80%

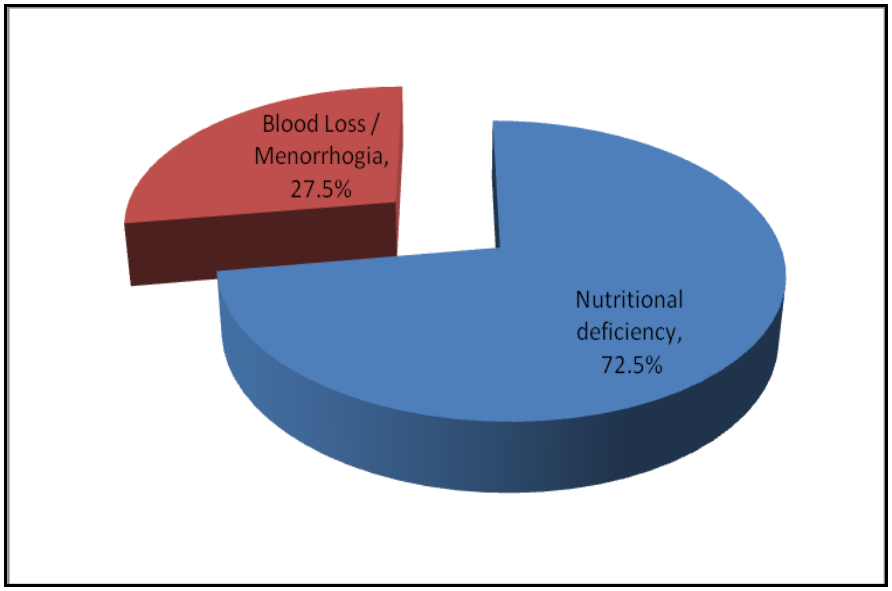


Inference:

Out of 40 Patients, 32 Patients (80%) were mixed diet and 8 Patients (20%) were vegetarian.

9. AETIOLOGICAL FACTORS

AETIOLOGY	NO. OF CASES	PERCENTAGE
Nutritional deficiency	29	72.5%
Blood Loss / Menorrhogia	11	27.5%

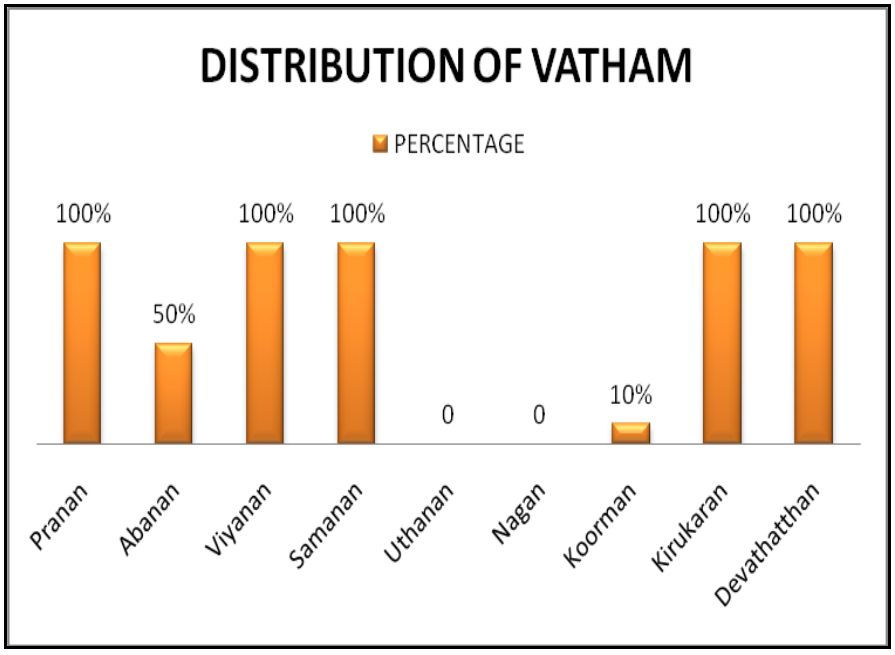


Inference:

Out of 40 Patients, 29 Patients (72.5%) were due to nutritional deficiency and 11 Patients (27.5%) were due to blood loss.

10. DISTRIBUTION OF VATHAM

VATHAM	NO OF CASES	PERCENTAGE
Pranan	40	100%
Abanan	20	50%
Viyanan	40	100%
Samanan	40	100%
Uthanan	0	0
Nagan	0	0
Koorman	4	10%
Kirukaran	40	100%
Devathatthan	40	100%
Thananjeyan	0	0

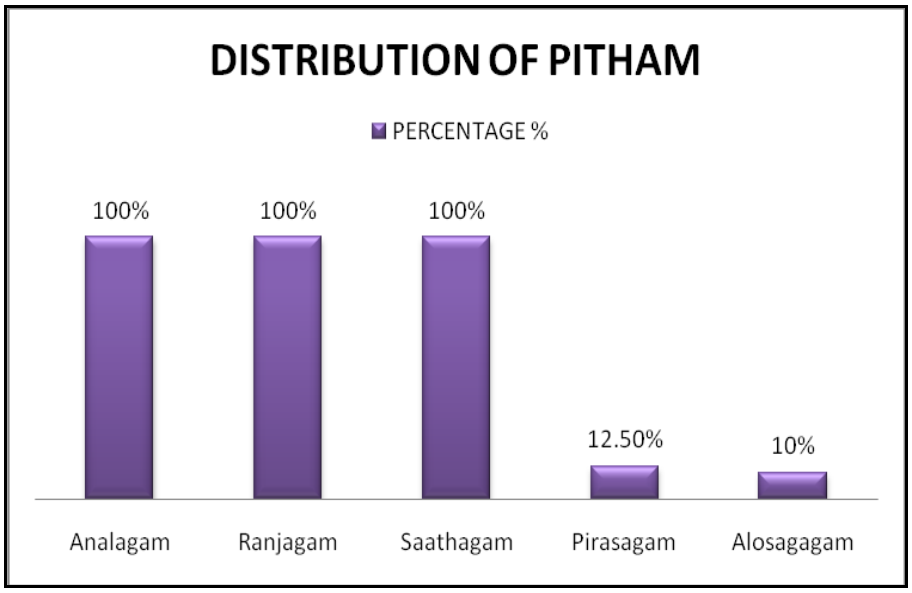


Inference:

Pranan affected in all patients (100%), Abanan affected in 20 patients (50%), Viyanan, Samanan, Kirukaran and Devathatthan affected in all patients (100%), Koorman affected in 4 patients (10%).

11. DISTRIBUTION OF PITHAM

PITHAM	NO. OF CASES	PERCENTAGE
Analagam	40	100%
Ranjagam	40	100%
Saathagam	40	100%
Pirasagam	5	12.5%
Alosagagam	4	10%

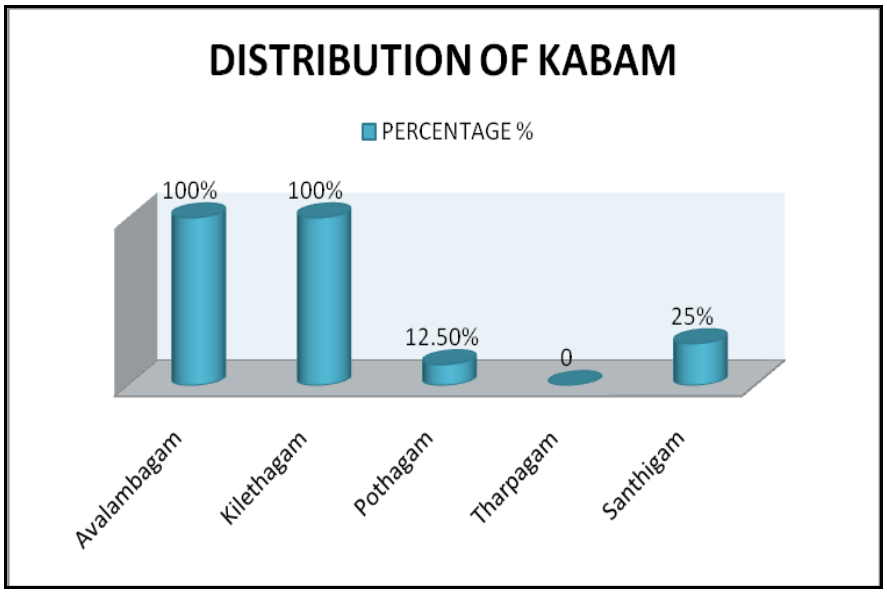


Inference:

Out of 40 patients, Analagam, Ranjagam and Saathagam affected in all patients (100%), Pirasagam affected in 5 patients (12.5%) and Alosagagam affected in 4 patients (10%).

12. DISTRIBUTION OF KABAM

KABAM	NO. OF CASES	PERCENTAGE
Avalambagam	40	100%
Kilethagam	40	100%
Pothagam	5	12.5%
Tharpagam	0	0
Santhigam	10	25%

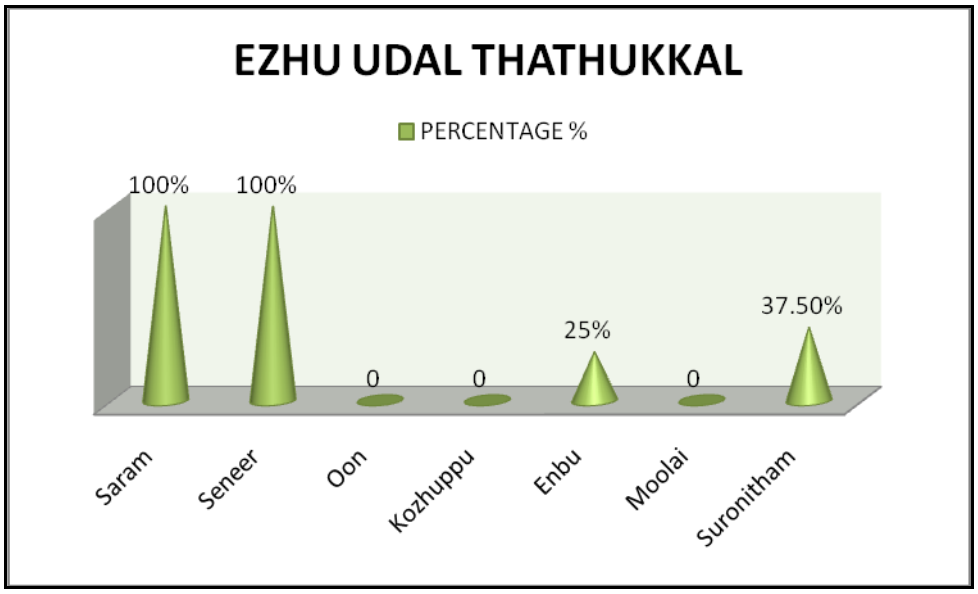


Inference:

Out of 40 patients, Avalambagam and Kilethagam affected in all patients (100%), Pothagam affected in 5 patients (12.5%) and Santhigam affected in 10 patients (25%).

13. EZHU UDAL THATHUKKAL

EZHU UDAL THATHUKKAL	NO. OF CASES	PERCENTAGE
Saram	40	100%
Seneer	40	100%
Oon	0	0
Kozhuppu	0	0
Enbu	10	25%
Moolai	0	0
Suronitham	15	37.5%

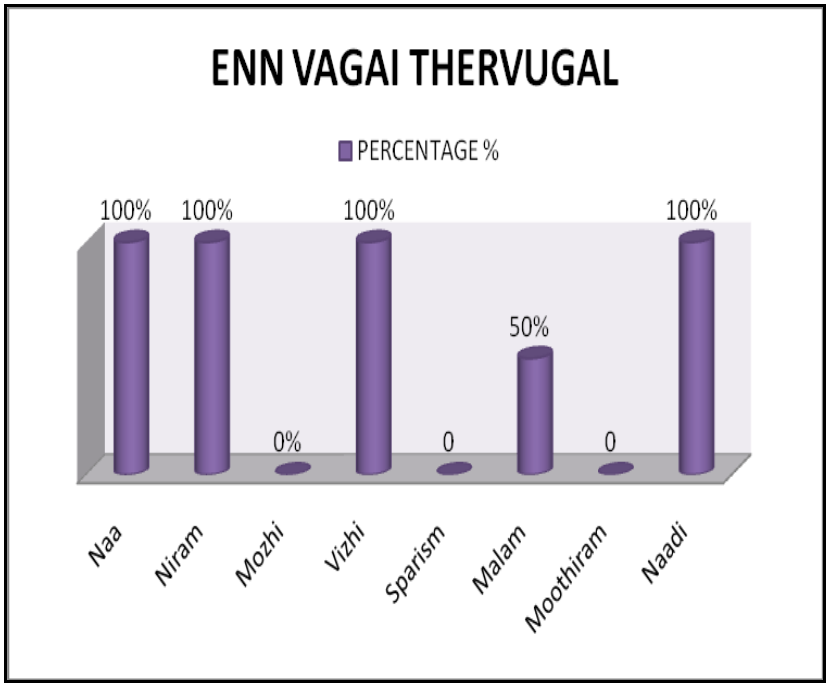


Inference:

Out of 40 patients, Saaram and Senneer affected in all patients (100%) , Suronitham affected in 15 patients (37.5%) and Enbu affected in 10 patients (25%)

14. ENN VAGAI THERVUGAL

THERVUGAL	NO. OF CASES	PERCENTAGE
Naa	40	100%
Niram	40	100%
Mozhi	0	0%
Vizhi	40	100%
Sparism	0	0
Malam	20	50%
Moothiram	0	0
Naadi	40	100%

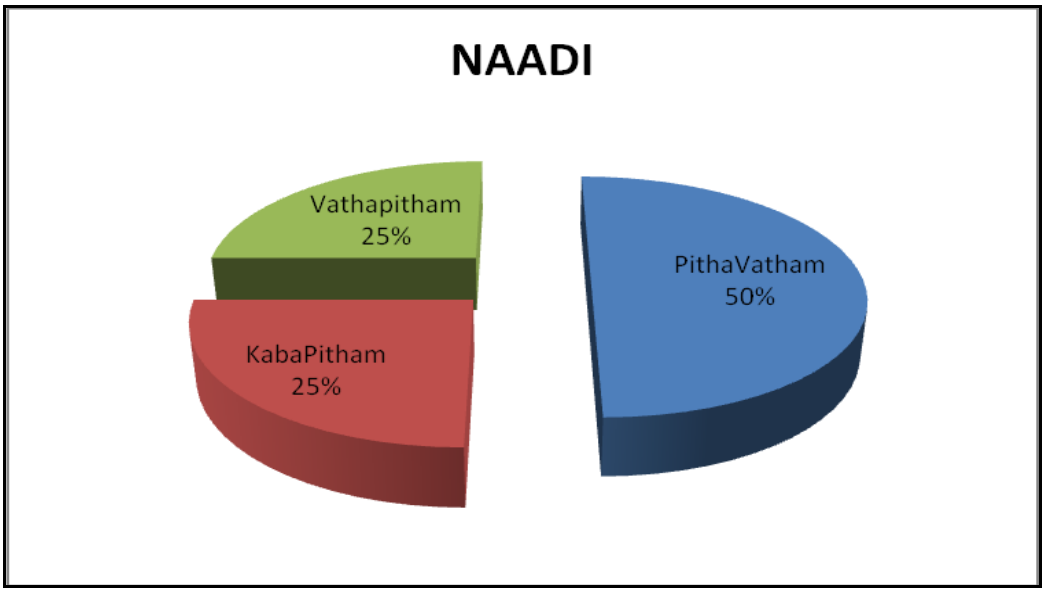


Inference:

Naa, Niram, Vizhi and Naadi were affected in all patients (100%), Malam affected in 20 patients (50%).

15. NAADI

NAADI	NO. OF CASES	PERCENTAGE
PithaVatham	20	50%
Kaba Pitham	10	25%
Vatha Pitham	10	25%

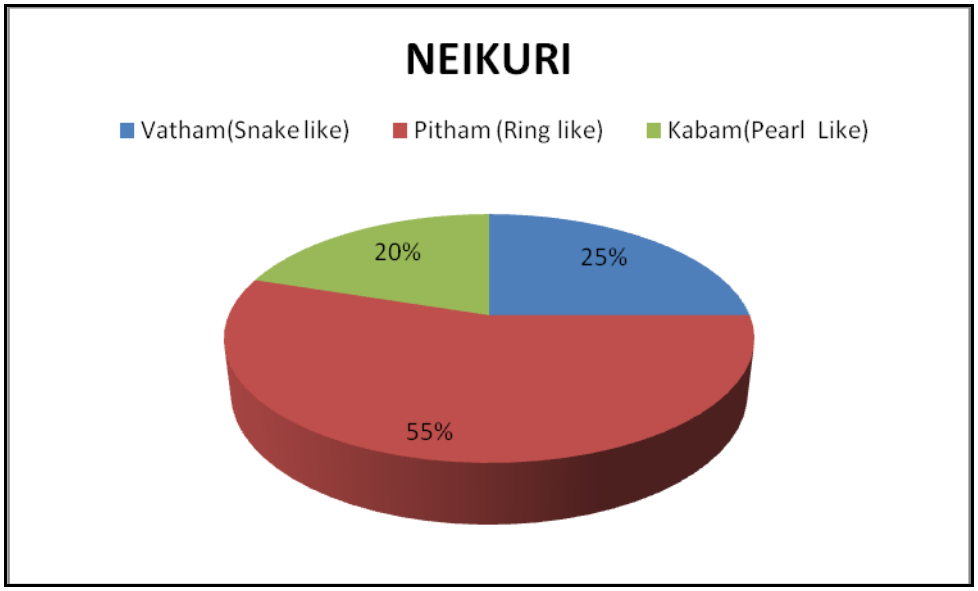


Inference:

50% of cases had Pitha Vatha Naadi, 25% of cases had Kaba Pitha Naadi and Vatha Pitham.

16. NEIKURI

NEIKURI	NO. OF CASES	PERCENTAGE
Vatham (Snake like)	10	25%
Pitham (Ring like)	22	55%
Kabam (Pearl Like)	8	20%

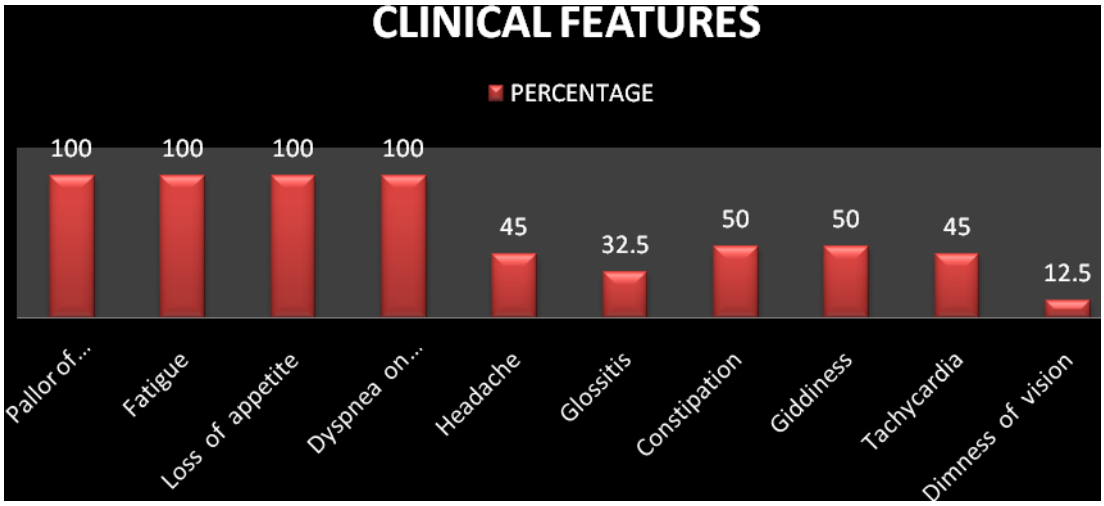


INFERENCE:

Out of 40 patients, 22 patients (55%) had Pitha Neer, 10 patients (25%) had Vatha Neer and 8 patients (20%) had Kaba Neer Neikuri.

17. CLINICAL FEATURES

S. NO	SIGNS & SYMPTOMS	NO. OF CASES	PERCENTAGE
1	Pallor of conjunctiva and nail bed	40	100
2	Fatigue	40	100
3	Loss of appetite	40	100
4	Dyspnea on exertion	40	100
5	Headache	18	45
6	Glossitis	13	32.5
7	Constipation	20	50
8	Giddiness	20	50
9	Tachycardia	18	45
10	Dimness of vision	5	12.5

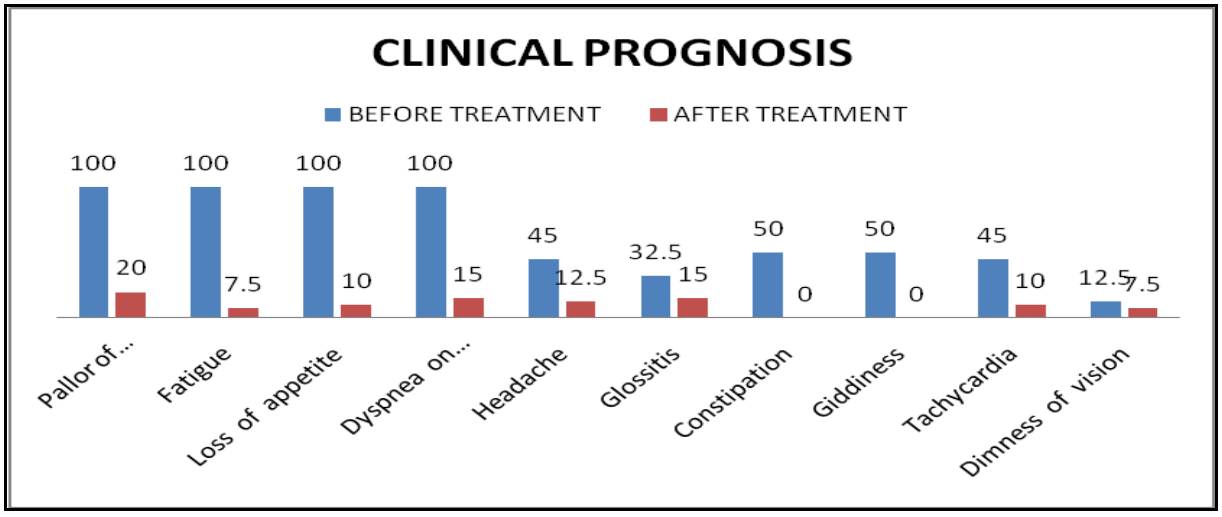


Inference:

Out of 40 patients, 40 patients (100%) had Pallor of conjunctiva and nail bed, Fatigue, Loss of appetite, Dyspnea on exertion, 18 Patients (45%) had Headache, 13 patients (32.5%) had Glossitis, 20 patients (50%) had Constipation, 20 patients (50%) had Giddiness, 18 patients (45%) had Tachycardia and 5 patients (12.5%) had Dimness of vision.

18. CLINICAL PROGNOSIS

S. No	SIGNS&SYMPTOMS	BEFORE TREATMENT		AFTER TREATMENT	
		NO. OF CASES	PERCENTAGE (%)	NO. OF CASES	PERCENTAGE (%)
1.	Pallor of conjunctiva and nail bed	40	100	8	20
2.	Fatigue	40	100	3	7.5
3.	Loss of appetite	40	100	4	10
4.	Dyspnea on exertion	40	100	6	15
5.	Headache	18	45	5	12.5
6.	Glossitis	13	32.5	6	15
7.	Constipation	20	50	0	0
8.	Giddiness	20	50	0	0
9.	Tachycardia	18	45	4	10
10.	Dimness of vision	5	12.5	3	7.5



Inference:

After treatment Pallor of conjunctiva and nail bed present in 8 patients (20%) , Tachycardia present in 4 patients (10%), Loss of appetite present in 4 patients (10%), Fatigue present in 3 patients (7.5%), Dyspnea on exertion present in 6 patients (15%), Headache present in 5 patients (12.5%), Glossitis present in 6 patients (15%) and Dimness of vision present in 3 patients (7.5%) due to ageing.

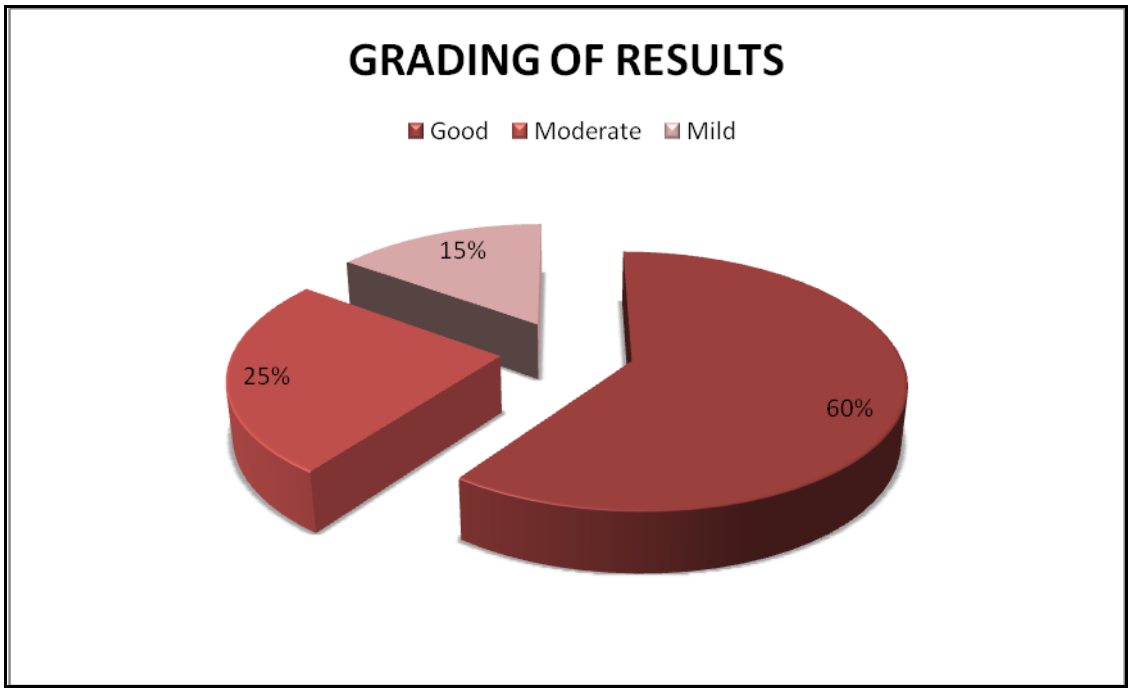
HAEMOGLOBIN LEVEL

S.NO	OP.NO	AGE/ SEX	BEFORE TREATMENT	AFTER TREATMENT
1	3888	40/f	10.0	12.1
2	9704	35/f	10.0	13.2
3	4516	41/f	9.8	11.9
4	5539	30/f	9.0	12.0
5	6689	34/f	8.3	10.9
6	6667	23/f	8.8	11.0
7	9724	32/f	10.0	13.1
8	1182	32/f	9.1	11.3
9	138	38/f	9.0	12.3
10	620	38/f	9.6	12.8
11	700	44/f	9.2	12.4
12	1089	19/f	7.5	9.8
13	1088	20/m	8.6	11.3
14	1057	28/f	8.7	11.8
15	5391	22/f	8.6	12.7
16	2509	27/f	9.9	12.0
17	2446	26/f	9.5	12.1
18	2480	30/f	9.8	12.9
19	6160	38/f	10.0	12.6

20	9139	38/f	9.0	12.2
21	7505	38/f	9.8	12.9
22	8750	37/f	8.6	11.8
23	8671	36/f	10.0	13.2
24	6379	35/f	10.0	12.6
25	8428	33/f	10.0	12.9
26	8278	50/f	9.5	12.5
27	9026	37/f	8.0	11.1
28	9229	20/f	10.0	13.2
29	383	24/f	10.0	13.1
30	1677	42/f	9.9	12.9
31	2199	42/f	10.0	13.3
32	2926	35/f	10.0	12.9
33	2953	47/f	9.8	12.6
34	3110	30/m	10.0	12.2
35	4544	42/f	8.0	11.1
36	5913	41/f	10.0	13.5
37	2208	48/f	7.6	8.8
38	6377	40/f	10.0	12.9
39	756	42/f	10.0	13.0
40	1197	19/f	8.8	10.4

19. GRADING OF RESULTS

S. No	GRADING OF RESULTS	NO. OF CASES	PERCENTAGE%
1.	Good	24	60%
2.	Moderate	10	25%
3.	Mild	6	15%



Good: Increase in Hb level between 3gms/dl and above after treatment .

Moderate: Increase in Hb level between 2gms/dl to 2.9 gms/dl after treatment

Mild: Increase in Hb level between 0.5gms/dl to 1.5gm/dl after treatment .

Inference:

Out of 40 patients, 24 cases (60%) shows good result, 10 cases (25%) shows moderate result, 6 cases (15%) shows mild result.

LIST OF PATIENTS

S.NO	OP.NO	AGE/ SEX	DATE OF MEDICINE STARTED	TOTAL NO OF TREATMENT DAYS	RESULT
1	3888	40/f	19.8.16	48 days	Moderate
2	9704	35/f	7.9.16	48 days	Good
3	4516	41/f	29.9.16	48 days	Moderate
4	5539	30/f	3.10.16	48 days	Good
5	6689	34/f	7.10.16	48 days	Mild
6	6667	23/f	7.10.16	48 days	Good
7	9724	32/f	19.10.16	48 days	Good
8	1182	32/f	15.11.16	48 days	Moderate
9	138	38/f	28.11.16	48 days	Moderate
10	620	38/f	30.11.16	48 days	Good
11	700	44/f	30.11.16	48 days	Good
12	1089	19/f	2.12.16	48 days	Moderate
13	1088	20/m	2.12.16	48 days	Moderate
14	1057	28/f	2.12.16	48 days	Good
15	5391	22/f	9.12.16	48 days	Good
16	2509	27/f	9.12.16	48 days	Good
17	2446	26/f	9.12.16	48 days	Good
18	2480	30/f	9.12.16	48 days	Mild
19	6160	38/f	26.12.16	48 days	Moderate
20	9139	38/f	29.12.16	48 days	Good

21	7505	38/f	30.12.16	48 days	Good
22	8750	37/f	4.1.17	48 days	Good
23	8671	36/f	4.1.17	48 days	Good
24	6379	35/f	4.2.17	48 days	Moderate
25	8428	33/f	13.2.17	48 days	Mild
26	8278	50/f	13.2.17	48 days	Good
27	9026	37/f	15.2.17	48 days	Good
28	9229	20/f	13.2.17	48 days	Good
29	383	24/f	20.2.17	48 days	Moderate
30	1677	42/f	24.2.17	48 days	Good
31	2199	42/f	27.2.17	48 days	Good
32	2926	35/f	1.3.17	48 days	Good
33	2953	47/f	1.3.17	48 days	Mild
34	3110	30/m	1.3.17	48 days	Good
35	4544	42/f	6.3.17	48 days	Good
36	5913	41/f	11.3.17	48 days	Good
37	2208	48/f	13.3.17	48 days	Mild
38	6377	40/f	13.3.17	48 days	Good
39	756	42/f	28.3.17	48 days	Good
40	1197	19/f	30.3.17	48 days	Moderate

LABORATORY INVESTIGATION

S.NO	OP.NO	BEFORE TREATMENT						AFTER TREATMENT					
		TC	DC			ESR		TC	DC			ESR	
			P	L	E	1/2	1		P	L	E	1/2	1
1	3888	11600	63	31	6	12	25	10900	61	30	7	4	8
2	9704	9800	62	33	5	18	38	9700	60	29	5	5	9
3	4516	8300	52	43	5	22	38	8500	58	40	5	6	12
4	5539	12500	77	16	7	35	75	12000	68	15	6	10	20
5	6689	6400	50	44	6	23	35	6800	49	46	4	8	16
6	6667	4900	55	37	8	10	22	4800	54	38	5	12	24
7	9724	10800	54	39	7	6	15	10700	56	39	8	7	15
8	1182	6300	48	42	9	6	12	6340	44	44.8	1.3	4	9
9	138	10700	54	36	6	6	16	10600	52	36	5	6	13
10	620	6800	64	30	6	16	24	6900	62	32	6	14	28
11	700	9400	54	40	6	38	62	9500	56	42	7	8	10
12	1089	7000	59	34	7	8	15	7100	54	36	9	7	10
13	1088	3500	75	21	4	4	10	3600	76	26	4	7	18
14	1057	7400	59	35	6	22	35	7600	62	34	6	12	26
15	5391	7300	60	37	3	6	20	7400	58	32	5	16	34
16	2509	10100	66	29	5	14	20	10000	70	21	8	10	18
17	2446	6300	60	33	7	10	21	6500	66	36	6	12	26
18	2480	9100	73	22	5	14	25	9200	56	42	7	6	13
19	6160	7700	62	32	6	10	25	7600	66	26	5	8	18
20	9139	8200	54	39	7	3	7	8300	66	28	7	9	20

21	7505	6900	70	24	6	7	18	7000	72	26	4	6	10
22	8750	11100	72	25	3	35	60	11200	58	48	6	7	16
23	8671	3300	78	18	4	14	20	3500	58	46	8	16	36
24	6379	7200	51	44	5	8	15	7300	52	38	5	8	17
25	8428	5900	52	40	8	10	18	11100	52	44	3	5	9
26	8278	8100	57	36	7	25	55	8200	52	38	4	13	26
27	9026	11000	49	42	9	14	24	11100	65	44	5	8	14
28	9229	7700	57	35	8	15	28	7800	66	34	6	4	9
29	383	6200	59	33	8	7	15	6400	66	36	7	12	24
30	1677	7400	63	31	6	35	80	7300	68	36	3	5	9
31	2199	10000	74	20	6	20	40	9800	60	30	2	8	10
32	2926	10100	74	20	6	20	38	10000	58	44	5	7	10
33	2953	7800	70	22	8	3	7	7900	64	36	1	3	9
34	3110	10300	58	34	8	12	25	10400	54	32	6	4	12
35	4544	10000	56	33	4	29	60	9800	58	34	3	20	40
36	5913	12800	67	28	5	25	40	12700	76	38	7	12	24
37	2208	9300	62	29	9	22	40	9400	58	46	0	9	18
38	6377	13900	71	22	7	15	35	14000	60	48	8	8	16
39	756	8600	53	41	6	5	12	8600	62	38	6	7	16
40	1197	8100	53	40	7	3	10	8200	56	42	7	8	18

TC-Total count, DC-Differential count, ESR-Erythrocyte Sedimentation Rate, Hb-Haemoglobin.

S.NO	OP.NO.	BEFORE TREATMENT			AFTER TREATMENT			URINE			MOTION					
		SUGAR	UREA	CHOL	SUGAR	UREA	CHOL	A	S	P	O		C		OB	
		(mg/dl)	(mg/dl)	(mg/dl)	(mg/dl)	(mg/dl)	(mg/dl)				BT	AT	BT	AT	BT	AT
1	3888	133	26	170	100	24	168	N	N	N	N	N	N	N	N	N
2	9704	98	28	178	104	22	170	N	N	N	N	N	N	N	N	N
3	4516	86	20	206	90	20	182	N	N	N	N	N	N	N	N	N
4	5539	103	24	162	110	26	204	N	N	N	N	N	N	N	N	N
5	6689	85	24	170	106	24	166	N	N	N	N	N	N	N	N	N
6	6667	98	22	179	102	22	176	N	N	N	N	N	N	N	N	N
7	9724	72	21	160	107	20	172	N	N	N	N	N	N	N	N	N
8	1182	98	26	178	97	30	176	N	N	N	N	N	N	N	N	N
9	138	75	19	170	88	21	169	N	N	N	N	N	N	N	N	N
10	620	110	22	190	98	19	180	N	N	N	N	N	N	N	N	N
11	700	97	23	184	89	21	182	N	N	N	N	N	N	N	N	N
12	1089	95	25	165	94	24	168	N	N	N	N	N	N	N	N	N
13	1088	92	26	164	108	20	160	N	N	N	N	N	N	N	N	N
14	1057	78	32	170	98	33	168	N	N	N	N	N	N	N	N	N
15	5391	71	36	162	89	31	170	N	N	N	N	N	N	N	N	N
16	2509	100	29	186	120	27	182	N	N	N	N	N	N	N	N	N
17	2446	73	38	170	109	34	178	N	N	N	N	N	N	N	N	N
18	2480	103	30	155	100	30	152	N	N	N	N	N	N	N	N	N
19	6160	73	27	187	98	35	180	N	N	N	N	N	N	N	N	N
20	9139	107	18	179	92	27	175	N	N	N	N	N	N	N	N	N
21	7505	90	22	176	104	25	156	N	N	N	N	N	N	N	N	N
22	8750	86	29	179	105	22	170	N	N	N	N	N	N	N	N	N
23	8671	109	23	160	110	30	164	N	N	N	N	N	N	N	N	N

24	6379	95	21	174	103	27	168	N	N	N	N	N	N	N	N	N
25	8428	76	22	162	109	29	158	N	N	N	N	N	N	N	N	N
26	8278	70	18	160	98	20	170	N	N	N	N	N	N	N	N	N
27	9026	85	22	175	121	35	174	N	N	N	N	N	N	N	N	N
28	9229	86	26	158	98	33	160	N	N	N	N	N	N	N	N	N
29	383	75	20	184	106	28	188	N	N	N	N	N	N	N	N	N
30	1677	80	29	190	121	24	174	N	N	N	N	N	N	N	N	N
31	2199	84	23	164	95	31	160	N	N	N	N	N	N	N	N	N
32	2926	84	19	164	108	35	160	N	N	N	N	N	N	N	N	N
33	2953	90	27	160	96	22	167	N	N	N	N	N	N	N	N	N
34	3110	98	30	180	109	30	170	N	N	N	N	N	N	N	N	N
35	4544	180	19.9	130	100	20	140	N	N	N	N	N	N	N	N	N
36	5913	80	24	165	110	29	161	N	N	N	N	N	N	N	N	N
37	2208	98	29	160	105	19	166	N	N	N	N	N	N	N	N	N
38	6377	71	22	175	104	24	164	N	N	N	N	N	N	N	N	N
39	756	95	24	171	109	19	176	N	N	N	N	N	N	N	N	N
40	1197	96	27	174	107	28	178	N	N	N	N	N	N	N	N	N

Hb- Haemoglobin, Blood sugar (R), Urea, CHO-Cholesterol, O-Ova, OB-Occult blood, C-Cyst, D-Deposits.

BLOOD INVESTIGATION

BEFORE TREATMENT

S. NO	OP. NO	AGE/ SEX	Hb/ Gms	RBC cells/ cumm	PCV %	MCV FI	MCH Pg	MCHC %
1	3888	40/f	10.0	4.3	26	70	20	29
2	9704	35/f	10.0	3.3	30	63	21.1	31
3	4516	41/f	9.8	3.2	29	60	29	33
4	5539	30/f	9.0	3.8	28	71	28	30
5	6689	34/f	8.3	3.7	27	73	17	30
6	6667	23/f	8.8	3.5	24	67	20	32
7	9724	32/f	10.0	4.1	26	68	24	28
8	1182	32/f	9.1	3.7	22	65	22.2	33.8
9	138	38/f	9.0	4.4	21	62	26	29
10	620	38/f	9.6	3.8	24	70	21	30
11	700	44/f	9.2	3.1	22	66	18	31
12	1089	19/f	7.5	4.0	26	64	27	33
13	1088	20/m	8.6	4.2	25	73	25	32
14	1057	28/f	8.7	3.6	27	69	21.3	34
15	5391	22/f	8.6	3.8	24	65	19	36
16	2509	27/f	9.9	3.2	28	64	23	29.1
17	2446	26/f	9.5	3.3	29	74	22	32
18	2480	30/f	9.8	3.5	26	72	27	35
19	6160	38/f	10.0	4.1	24	68	26.2	36
20	9139	38/f	9.0	3.3	25	58	19.4	28

21	7505	38/f	9.8	3.6	22	65	21.2	27
22	8750	37/f	8.6	3.8	29	72	20.3	34
23	8671	36/f	10.0	4.2	25	69	31	32
24	6379	35/f	10.0	4.4	27	67	21	40
25	8428	33/f	10.0	3.5	28	63	28	38
26	8278	50/f	9.5	3.7	26	76	19.5	25
27	9026	37/f	8.0	3.2	30	70	25.2	28
28	9229	20/f	10.0	4.1	26	77	22	26
29	383	24/f	10.0	4.2	28	68	18	29
30	1677	42/f	9.9	3.4	22	70	23	33
31	2199	42/f	10.0	3.8	26	65	28	37
32	2926	35/f	10.0	3.9	26	69	24.2	36
33	2953	47/f	9.8	4.1	30	74	26	34
34	3110	30/m	10.0	3.6	27	62	29	26
35	4544	42/f	8.0	3.9	25	66	21.3	30
36	5913	41/f	10.0	4.1	22	68	21	25
37	2208	48/f	7.6	3.3	28	76	25	23
38	6377	40/f	10.0	3.7	24	74	20	21
39	756	42/f	10.0	4.4	26	66	17	38
40	1197	19/f	8.8	3.9	29	68	23	28

Hb - Haemoglobin, PCV - Packed cell volume, MCV - Mean corpuscular volume, MCH - Mean corpuscular haemoglobin, MCHC - Mean corpuscular haemoglobin concentration.

AFTER TREATMENT

S. NO	OP. NO	AGE/ SEX	Hb/ Gms	RBC cells/ cumm	PCV %	MCV FI	MCH Pg	MCH C %
1	3888	40/f	12.1	4.4	28	74	26	31
2	9704	35/f	13.2	3.5	32	78	27.2	34
3	4516	41/f	11.9	3.6	33	68	33	36
4	5539	30/f	12.0	3.9	30	88	36	32
5	6689	34/f	10.9	3.8	29	93	21	31
6	6667	23/f	11.0	3.6	26	80	29	33
7	9724	32/f	13.1	4.0	28	79	34	30
8	1182	32/F	11.3	5.9	22	85	22	33
9	138	38/f	12.3	4.2	24	78	36	30
10	620	38/f	12.8	3.9	26	82	30	32
11	700	44/f	12.4	3.3	24	78	26	33
12	1089	19/f	9.8	4.1	28	74	36	35
13	1088	20/m	11.3	4.3	29	90	30	36
14	1057	28/f	11.8	3.8	26	82	26	38
15	5391	22/f	12.7	3.9	30	80	28	37
16	2509	27/f	12.0	3.4	32	76	30	31
17	2446	26/f	12.1	3.5	28	88	32	34
18	2480	30/f	12.9	3.7	26	90	29	37
19	6160	38/f	12.6	4.2	28	80	31.2	39
20	9139	38/f	12.2	3.5	26	70	22.2	30
21	7505	38/f	12.9	3.7	24	78	27	29

22	8750	37/f	11.8	3.9	30	86	26	35
23	8671	36/f	13.2	4.3	27	80	34	34
24	6379	35/f	12.6	4.5	29	74	28	41
25	8428	33/f	12.9	3.7	31	76	32	40
26	8278	50/f	12.5	3.9	28	88	24	27
27	9026	37/f	11.1	3.5	32	86	28	30
28	9229	20/f	13.2	4.3	28	87	26	28
29	383	24/f	13.1	4.4	30	80	22	31
30	1677	42/f	12.9	3.6	24	86	26	35
31	2199	42/f	13.3	3.9	28	78	32	39
32	2926	35/f	12.9	4.2	30	82	28.6	38
33	2953	47/f	12.6	4.3	24	86	31	36
34	3110	30/m	12.2	3.8	28	74	34	28
35	4544	42/f	11.1	4.1	32	78	26.2	32
36	5913	41/f	13.5	4.2	29	78	27	27
37	2208	48/f	8.8	3.5	30	86	28	25
38	6377	40/f	12.9	3.8	26	86	26	24
39	756	42/f	13	4.5	28	76	22	38
40	1197	19/f	10.4	4.1	31	80	29	30

DISCUSSION

DISCUSSION

"Pitha Paandu," a nutritional deficiency disease described by Yugi Munivar in his Yugi Vaidhya Chinthamani 800. The clinical features are pallor of conjunctiva and nail bed, fatigue, loss of appetite, dyspnoea on exertion, headache, giddiness, glossitis, constipation, parasthesia in fingers and toes. The symptoms of Pitha Paandu are mostly similar to that of symptoms of Iron deficiency anaemia. It is one of the micro nutrient disorder and its prevalence rate is higher among Indians due to lack of nutrition and education. It is estimated that globally, nearly two billion people are affected by Iron deficiency anaemia.

The patients were examined based on Siddha and as well as Modern aspects. The results obtained from their studies were discussed below for better conclusion.

40 patients were treated in the outpatient Department of Pothu Maruthuvam, Government Siddha Medical College, attached to Arignar Anna Hospital, Arumbakkam, Chennai -106. The time duration for treatment was 48 days and all necessary investigations were carried out to all patients and trial medicine was given and followed up regularly in the OP department once in 7 days.

1. Drug authentication

The fresh samples of Sarakondrai leaves and flowers are authenticated based upon the organoleptic/macroscopic/microscopic examination by the concerned Botanist from Govt Siddha Medical College, Arumbakkam, Chennai.

2. Physicochemical analysis

- The total ash value of Sarakondrai chooranam was 9.34%
- The acid insoluble ash value was 1.92%
- The water soluble ash value was 4.63%
- Alcohol soluble extractive value was 24.75%
- Water soluble extractive value was 31.47%

3. IAEC (Institutional Animal Ethics Committee)

All the protocols and the experiments conducted in strict compliance according to ethical principles and guidelines provided by committee for the purpose of control and supervision of experiments on Animals (CPCSEA). The animal experimental protocol was approved by the IAEC of Sathyabama University, Chennai.

4. Toxicity study

Acute Toxicity Study

Acute toxicity study of the study drug *Sarakondrai Chooranam* was carried out as per OECD guideline (Organization for Economic Co-operation and Development) Guideline-423.

Sub-acute toxicity

Sub-acute toxicity study of the study drug *Sarakondrai Chooranam* was carried out as per OECD guideline (Organization for Economic Co-operation and Development) Guideline-407. The experimental protocol was approved by the IAEC of Sathyabama University, Chennai. IAEC Approval No: SU/CLATR/IAEC/IV/018/2016.

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Hematological analysis

When compared to the control group, treatment groups has no significant difference and hence treatment groups has no toxicity and haematological differences.

Biochemical analysis

No significant difference between control and treatment groups and found no impacts in serological functions in treatment groups.

Histopathological evaluation

Histopathological evaluation shows no hepatotoxic, nephrotoxic, neurotoxic contents in the trial drug.

Statistical analysis

The statistical analysis was carried by one way ANOVA (GRAPH PAD PRISM 5 computer program). Results were expressed as mean ± standard error. A statistical comparison was carried out using the Dunnet's test for the control and treatment group.

5.Pharmacological study

Pharmacological Evaluation of *Sarakondrai Chooranam* on Phenyl hydrazine induced Anaemia in wistar rats has been approved by the IAEC of Sathyabama University, Chennai. IAEC Approval No: SU/CLATR/IAEC/IV/018/2016.

6. Bio-Chemical Analysis

The Bio-chemical analysis of *Sarakondrai chooranam* contains Iron, Copper, Reducing sugar and Alkaloids.

7. Institutional Ethics Committee (IEC)

The study was approved by Institutional Ethics Committee (IEC) and the approval number is GSMC-CH-ME-4/2015/011. It was registered in Clinical Trials Registry – India (CTRI) and the registration number is CTRI/2017/06/008735.

8. Clinical study

Blood and Urine Investigations were taken before and after treatment.

All the patients were treated with the trial drug *Sarakondrai chooranam* for an average of 48 days. Blood and urine were once again tested after the completion of treatment.

Sex:

Among 40 cases, 38 Patients (95%) were Females and 2 Patients (5%) were Males. Females are mostly affected than Males due to menstrual blood loss and malnourished diet.

Age:

Out of 40 patients, 7 Patients (17.5%) were in the age group of 15-25, 13 Patients (32.5%) were in the age group of 26-35, 12 Patients (30%) were in the age group of 36- 45, 8 Patients (20%) were in the age group of 46-60. The incidence was increased in the age group of 15-45 due to menstrual blood loss.

Kaalam:

Out of 40 patients, 20 Patients (50%) comes under Vatha Kaalam and 20 Patients (50%) comes under Pitha Kaalam.

Paruvakaalam:

Out of 40 patients, 10 patients (25%) comes under Pinpani, 9 patients (22.5%) comes under Munpani, 8 patients (20%) comes under Kaarkalam, 7 patients (17.5%) comes under Koothir kaalam, 5 patients (12.5%) comes under Mudhuvenil Kaalam and 2 patients (5%) comes under Elavenil kaalam.

Thinai:

Out of 40 patients, 20 Patients (50%) comes under Neithal , 15 patients (37.5%) comes under Marutham and 5 patients (12.5%) comes under Kurinji.

Occupation:

Out of 40 patients, 8 Patients (20%) were students, 5 patients (12.5%) were Labourers , 25 Patients (62.5%) were house wives and remaining 2 patients (5%) were office going.

Socio-economic status:

Out of 40 patients, 5 Patients (12.5%) belongs to middle income group , 35 patients (87.5%) belongs to low income group. Economically low income group were more affected than middle or high income group due to their malnourished diet.

Diet:

Out of 40 patients, 32 Patients (80%) were mixed diet and 8 Patients (20%) were vegetarian.

Aetiological factors:

Out of 40 patients, 29 patients (72.5%) were due to nutritional deficiency and 11 patients (27.5%) due to blood loss. So, the nutritional deficiency plays a major role in causing Iron deficiency Anaemia.

Mukkutram:

Vatham:

- Praanan was affected in all the patients (100%) reflected as dyspnoea on exertion.
- Abanan was affected in 20 patients (50%) reflected as constipation and menorrhagia.
- Viyanan was affected in all patients (100%) reflected as joint pain.
- Samanan was affected in all patients (100%) reflected as loss of appetite.
- Koorman was affected in 4 patients (10%) reflected as dimness of vision.
- Kirugaran was affected in all patients (100%) reflected as loss of appetite and Devathathan was affected in all patients (100%) resulting in fatigue.

Pitham:

- Analagam was affected in all patients (100%) producing loss of appetite.
- Ranjagam was affected in all patients (100%) resulting in pallor of conjunctiva and nail bed.
- Saathagam was affected in all patients (100%).
- Pirasagam was affected in 5 patients (12.5%) resulting in pallor of skin.
- Alosagam was affected in 4 patients (10%) reflected as dimness of vision.

Kabam:

- Avalambagam was affected in all patients (100%) resulting in dyspnoea on exertion.
- Kilethagam was affected in all patients (100%) resulting in loss of appetite.
- Pothagam was affected in 5 patients (12.5%) resulting in loss of taste or bitter taste.
- Santhigam was affected in 10 patients (25%) resulting pain in knee joints.

Ezhu udal thathukkal:

- Saaram was affected in all patients (100%) causing tiredness.
- Senneer was affected in all patients (100%) producing pallor of conjunctiva and nail bed.
- Suronitham was affected in 15 patients (37.5%) reflected as menorrhagia.

Ennvagai thervugal:

- All patients Naa, Niram , Vizhi and Naadi were affected reflected as pallor of conjunctiva and nail bed.
- Malam was affected in 20 patients (50%) due to constipation.

Naadi:

- 50% of cases had Pitha Vatha Naadi,

"இடமான சேத்துமத்தில் பித்த நாடி

எழுந்தனுகில் விடமுடனே வீக்கமுண்டாம்

.....

விடமான நெஞ்சடைப்பு சுவாசம் விக்கல்

வெகுசுரமும் நாவறட்சி பாண்டுரோகம்”

- 25% of cases had Kaba Pitha Naadi and Vatha Pitha Naadi.

Neikuri:

Out of 40 patients, 22 patients (55%) had Pitha Neer, 10 patients (25%) had Vatha Neer and 8 patients (20%) had Kaba Neer Neikuri.

Investigations:

Investigations like TC, DC, ESR, Hb, PCV, MCV, MCH, MCHC, Blood Sugar, Blood Urea, Serum Creatinine and Routine Urine and Motion Test were taken before and after treatment.

Clinical symptoms:

Out of 40 patients, 40 patients (100%) had Pallor of conjunctiva and nail bed, Fatigue, Loss of appetite, Dyspnea on exertion, 18 Patients (45%) had Headache, 13 patients (32.5%) had Glossitis, 20 patients (50%) had Constipation and Giddiness, 18 patients (45%) had Tachycardia and 7 patients (17.5%) had Dimness of vision.

Clinical Prognosis:

After treatment Pallor of conjunctiva and nail bed present in 8 patients (20%), Loss of appetite and Tachycardia present in 4 patients (10%), Fatigue present in 3 patients (7.5%), Dyspnea on exertion present in 6 patients (15%), Headache present in 5 patients (12.5%) and Dimness of vision present in 3 patients (7.5%)**.**

Haemoglobin level:

Out of 40 patients,

- 22 cases shows increase in Hb level between 3gms/dl and above after treatment (55%).
- 11 cases shows increase in Hb level between 2gms/dl to 2.9 gms/dl after treatment (27.50%).

- 7 cases shows increase in Hb level between 0.5gms/dl to 1.5gm/dl after treatment (17.5%).

Trial medicine:

- ***Sarakondrai chooranam*** was administered 2 gm BD with milk after food for 48 days.
- The taste of ***Sarakondrai chooranam*** is principally thuvarppu. In Pitha Paandu, pitham is deranged and the deranged pitha kuttram was neutralized by thuvarppu suvai there by it act on Ethirurai maruthuvam.

Qualitative analysis:

- In ***Sarakondrai chooranam***, basic radicals like Iron, Copper, Alkaloids were present.

Toxicological studies:

The results of acute toxicity study of ***Sarakondrai chooranam*** revealed no mortality, no abnormal signs and behavioral changes in rats at the dose of 2000 mg/ kg body weight administered orally.

Acute and Sub-Acute oral toxicity:

- At the end of the studies the animals were sacrificed and the haematological parameters, biochemical parameters, urine parameters and histopathology of vital organs like liver, heart, spleen and kidney were carried out.
- The study results show that the trial drug was safe and did not produced any toxic effects.

Pharmacological study:

- The induction of Anaemia in rats was performed by the intraperitoneal administration of 40 mg/kg of Phenyl hydrazine (PHZ) for two days. The trial drug were given single oral dose daily for 3 weeks and the results were observed .
- After the administration of test drug ***Sarakondrai chooranam,*** the hematological parameters are significantly increased ($P \leq 0.001$).

Bio statistical report:

- The bio statistical report reveals that, the trial medicine shows a significant improvement with P value < 0.001 and the mean difference of Hb level before and after treatment is 2.92±0.07 (gm/dl), also there is a significant reduction in signs and symptoms among the patients. Hence it is concluded that the treatment was effective and significant.
- It results as the treatment was significantly improving the HB level (gms/dl).
- Since, the **p** value is highly significant (p<0.001) in all signs and symptoms there is significant reducing of signs and symptoms among the patients for the treatment of Pitha paandu (Iron deficiency anaemia). Hence, it is concluded that the treatment was effective and **significant.**

Grading of results:

Out of 40 patients, 24 cases (60%) shows good result, 10 cases (25%) shows moderate result, 6 cases (15%) shows mild result after treatment.

SUMMARY

SUMMARY

The clinical study on **PITHA PAANDU** was carried out in Post graduate department of Maruthuvam, Government Siddha Medical College, attached to Arignar Anna Hospital, Chennai –106 during the period of 2015 - 2017.

40 patients were treated in the outpatient department. The clinical and pathological assessment was carried out on the basis of both Siddha and Modern aspects.

All the 40 patients were treated with ***Sarakondrai chooranam*** (2 gm/bd daily with milk). The duration of the treatment was fixed as 48 days. The patients are monitored once in 7 days.

The results obtained from the studies are summarized below:

- The prevalence was found to be higher in females (95%).
- High incidence of patients were noted in the age group of 26 -35 years (37.5%).
- Out of 40 patients, 50% of cases comes under Vatha Kaalam and 50% of cases comes under Pitha Kaalam.
- Majority of patients comes under Pinpani kaalam (25%).
- In Thinai, Neithal thinai (50%) and Marutham thinai (37.5%) people are mostly affected.
- In Occupational status, housewife (62.5%) was mostly affected.
- Economically low income group (87.5%) were more affected.
- Among dietary patterns, (80%) of patients were mixed diet.
- Aetiological factors, Nutritional deficiency (72.5%) plays a major role in Pitha Paandu.
- In Vatham, Piranan, Viyaanan, Samanan, Kirugaran, Devathathan were affected in all patients.
- In Pitham, Analagam, Ranjagam, Sathagam were affected in all patients.
- In Kabam, Avalambagam, Kilethagam were affected in all patients.
- In Ezhu udal thathukal, Saaram and Senneer were affected in all patients.
- In Envagai thervugal, Naa, Niram and Vizhi were affected in all patients.
- Most of the patients had Pitha Vatha naadi (50%).

- The clinical trial shows that there is significant improvement in the clinical manifestations of Pitha Paandu.
- Regarding Haemoglobin level, 22 cases shows increase in Hb level between 3gms/dl and above after treatment (55%), 11 cases shows increase in Hb level between 2gms/dl to 2.9 gms/dl after treatment (27.50%) and 7 cases shows increase in Hb level between 0.5gms/dl to 1.5gm/dl after treatment (17.5%)
- The trial medicine having thuvarppu suvai which neutralizes the deranged Pitham by Ethirurai maruthuvam.
- Also the trial drug have Vermifuge and Laxative activity.
- In Qualitative analysis, basic radicals like Iron, Copper, Alkaloids and Reducing sugar were present.
- The pre-clinical studies shows that the trial medicine was safe with significant Haematinic activity.
- The Bio statistical report of the clinical trial shows significant P value <0.001 and concluded that, the treatment is effective and significant.
- Among 40 patients, 24 cases (60%) shows Good result, 10 cases (25%) shows Moderate result, 6 cases (15%) shows Mild result after treatment.

CONCLUSION

CONCLUSION

- **Pitha Paandu** is primarily due to the derangement of pitham .
- The trial medicine ***Sarakondrai Chooranam*** predominating with Thuvarppu taste it neutralizes the deranged pitham by **Ethirurai Maruthuvam.**
- The trial medicine ***Sarakondrai Chooranam*** is economical.
- From the Pre Clinical Toxicological studies, ***Sarakondrai Chooranam*** reveals no toxicity and hence proved to be safe.
- From the Pre Clinical Pharmacological studies, it reveals that the ***Sarakondrai Chooranam*** possess significant Haematinic activity.
- No adverse effects was reported during the course of the treatment.
- In Clinical study, ***Sarakondrai Chooranam*** gave maximum relief from the symptoms of Pitha Paandu and increases the Haemoglobin level.
- Therefore I conclude that ***Sarakondrai Chooranam*** is an effective Haematinic drug for the remedy of **Pitha Paandu** .

Tha Tamil Nadu Dr.M.G.R.Medical University

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This Certificate is awarded to Dr/~~Mr/Mrs~~.....M...Shanmuga Priya.....

for participating as ~~Resource Person~~ / Delegate in the Seventeenth (XVII) Workshop on

" RESEARCH METHODOLOGY & BIOSTATISTICS "

FOR AYUSH POST GRADUATES & RESEARCHERS

Organized by the Department of Siddha

The Tamil Nadu Dr. M.G.R. Medical University from 15th to 19th June 2015.

Dr.N.KABILAN, M.D.(Siddha)
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Prof. **Dr.P.ARUMUGAM,** M.D.,
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Prof. **Dr.D.SHANTHARAM,** M.D., D.Diab.,
VICE - CHANCELLOR

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AUTHENTICATION CERTIFICATE

Based upon the organoleptic/macroscopic/microscopic examination of fresh/market sample, it is certified that the specimen given by Dr. M. Shanmuga Priya BSMS studying MD (S), Government Siddha Medical College, Arumbakkam, Chennai is identified below

Binomial name: ***Cassia fistula*** **Linn.**

Family: Caesalpiniaceae

Synonym(s): ***Cassia fistuloides*** **Collad.**

Regional names: Tamil: Manjal Sarakondrai, English: Golden shower flower

References: Flora of Presidency, Gamble, J. S

1/6/2016

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GSMC/MB-03/2016

Date:01.06.2016

CERTIFICATE

This is to certify that the project entitled **"TOXICITY EVALUATION OF *SARAKONDRAI CHOORANAM* BY ACUTE TOXICITY - OECD 423 AND SUB-ACUTE REPEATED DOSE ORAL TOXICITY STUDY- OECD 407 IN RATS"** has been approved by the IAEC of Sathyabama University, Chennai.

IAEC Approval No.: **SU/CLATR/IAEC/IV/018/2016**
Animal Sanctioned: *Rattus norvegicus* / Wistar albino rats
Male: 6; Female: 12; Total: 18 (Eighteen)
Date: 5.3.2016

B. Sheela Rani 14/3/16.

DR.B.SHEELA RANI
Chair Person

DR.R.ILAVARASAN
CPCSEA Main Nominee

LABORATORY ANIMAL TECHNOLOGY AND RESEARCH (CLATR) ★ CENTRE FOR
SATHYABAMA UNIVERSITY
Chennai - 600 119

Project Report on Toxicity Profiling of Sarakondrai Chooranam

Name Dr. M. Shanmuga Priya

IAEC SU/CLATR/IAEC/IV/018/2016

Name of the Formulation Sarakondrai Chooranam

Abbreviation SLC

ACUTE TOXICITY

Sarakondrai Chooranam was carried out as per OECD guideline (Organization for Economic Co-operation and Development) Guideline-423.

Animal

Healthy adult Wistar albino rat weighing between 170-200 g were used for the study. The animals were housed in poly propylene cages and were kept in well ventilated with 100% fresh air by air handling unit (AHU). A 12 light / dark cycle were maintained .Room temperature was maintained between 22 $\pm$ 2^0 Cand relative humidity 50–65%. They were provided with food (Sai feeds, Bangalore, India) and water *ad libitum*. All the animals were acclimatized to the laboratory for 7 days prior to the start of the study.

The experimental protocol was approved by The Institutional Animal Ethics Committee of Sathyabama University, Chennai, Tamil Nadu, India.

Acute toxicity Study

Acute toxicity study will be carried out in accordance with OECD guideline 423[(59)] . The animals were fasted overnight with free access to water. The study was conducted with single oral dose administration of *Sarakondrai Chooranam*.

IAEC SU/CLATR/IAEC/IV/018/2016

Animal Grouping

One group consist of 6 female rats were used for this study . The dose utilized for evaluation of acute toxicity study is about 2000 mg/kg higher than that of the therapeutic dose.

Animal Grouping

GROUP I : Animals received Test drug 2000 mg/kg (p.o)

The animals were fasted overnight (12- 16 hrs) with free access to water. The study was conducted with single oral administration of study drug S*arakondrai Chooranam* 2000mg/kg (p.o). The animals were observed continuously for first 72 h and then 14 days for emerging signs of behavioral changes, body weight changes and for mortality.

Occurrence of toxicity in animals were observed continuously for the first 4 to 24 h and observed periodically for the next 14 days. Observation includes the change in skin, fur, eyes and mucus membrane. Appearance of C.N.S,C.V.S and A.N.S related toxicity such as tremors, convulsions, sedation, steric behavior, respiratory distress, cardiovascular collapse, response to sensory stimuli, salivation, diarrhea, lethargy, sleep, coma and mortality were observed with special attention.

Body weight was recorded periodically. At the end of the experiment all animals were subjected for gross necropsy and observed for pathological changes.

SUB-ACUTE TOXICITY STUDY

Sub-acute toxicity study was carried out as per OECD guidelines Guideline-407. [60]

Animals

Healthy adult Wistar albino rat weighing between 170-200 g were used for the study. The animals were housed in poly propylene cages and were kept in well ventilated with 100% fresh air by air handling unit (AHU). A 12 light / dark cycle were maintained. Room temperature was maintained between 22 $\pm$ 2^{o} Cand relative humidity 50–65%. They were provided with food (Sai feeds, Bangalore, India) and water *ad libitum*. All the animals were acclimatized to the laboratory for 7 days prior to the start of the study.

The experimental protocol was approved by The Institutional Animal Ethics Committee of Sathyabama University, Chennai, Tamil Nadu, India.

Animal Grouping

Animals were divided into three groups of 06 animals each consist of 3 male and 3 female rats.

GROUP I : Animals received saline 5 ml/kg b.w (p.o)

GROUP II : Animals received low dose of test drug 200 mg/kg (p.o)

GROUP III : Animals received high dose of test drug 400 mg/kg (p.o)

The animals were randomly divided into control group and drug treated groups for two different doses viz. low dose (200 mg/kg b.w) and high dose (400 mg/kg b.w).

The animals were administrated with the study drug once daily for 28 days. The animals in group I (control group) received normal saline 5 ml/kg b.w. The animals in group II received low dose of *Sarakondrai Chooranam* 200 mg/kg b.w(p.o) and group III received high dose of *Sarakondrai Chooranam* 400 mg/kg b.w(p.o).

The rats were weighed periodically and observed for signs of toxicity pertains to C.N.S, C.V.S, A.N.S including behavioral changes, food - water intake and morphological changes. At the end of 28^{th} day, the animals were fasted for overnight with free access to water. On 29^{th} day the animals were sacrificed with excess anesthesia. Blood samples were collected from aorta and stored in EDTA (ethylenediamine –tetra actate) for Hematological analysis and for serum generation for biochemical analysis.

The vital organs including heart, brain, lungs, spleen, kidneys, liver, stomach, testes, and ovary were harvested and carefully examined for gross lesions. The organs were preserved in 10% formalin for histopathological assessment and interpretation.

Hematological analysis

Blood samples were analyzed using established procedures and automated Bayer Hematology analyzer. Parameters evaluated include Packed Cell Volume (PCV), Red Blood Cells (RBC) count, White blood cell count (WBC), Platelet Count, Hemoglobin (Hb), Mean cell Haemoglobin Concentration (MCHC), Mean Red Cell Volume (MCV), Mean Cell Hemoglobin (MCH), Mean platelet volume (MPV), Neutrophils, Eosinophil's, Basophils, Lymphocytes and Monocytes.

Biochemical analysis[(61)]

Serum samples were analyzed for High Density Lipoprotein (HDL), Low density Lipoprotein (LDL) , Very low density Lipoprotein (VLDL) , Triglycerides (TGL), Total Cholesterol , Blood urea nitrogen (BUN), Creatinine, Albumin, Total Protein, Glucose, Uric acid, Aspartate Transaminase (AST), Alanine amino Transaminase (ALT) and Alkaline Phosphatase (ALP) using Mind ray auto analyzer model BS 120.

Histopathological evaluation[62]

Organs included of heart, brain, lungs, spleen, kidneys, liver, stomach, testes and ovary. Histological slides of organs were made and observed under the microscope. The pathological observations of cross section of these organs were performed on gross and microscopic bases. Histological examinations were performed on the preserved tissues with particular emphasis on those which showed gross pathological changes.

Statistical analysis

The statistical analysis was carried by one way ANOVA (GRAPH PAD PRISM 5 computer program). Results were expressed as mean ± standard error .A statistical comparison was carried out using the Dunnet's test for the control and treatment group.

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RESULTS

Assessment of clinical signs in rats treated with *Sarakondrai Chooranam* in Acute toxicity study

Parameter	Group I
Clinical Signs Parameters for the duration of 14 days	Test Drug 2000mg/ Kg
Number of animals observed	6 Female
Lacrimation	Absence
Salivation	Absence
Animal appearance	Normal
Tonic Movement	Absence
Clonic Movement	Absence
Laxative action	Absence
Touch Response	Normal
Response to Sound	Normal Response

Response to Light	Normal Response
Mobility	Normal Response
Respiratory Distress	Nil
Skin Color	Normal
Stereotype behaviour	Absence
Piloerection	Absence
Limb Paralysis	Absence
Posture	Normal
Open field behaviour	Normal
Gait Balancing	Normal
Freezing Behaviour	Absent
Sings of Stress and Anxiety	None Observed
Muscular coordination	Normal
Muscle grip	Normal
Sedation	Absence
Social Behavior	Normal
Urine Analysis	No Abnormality
Urine Colour	Yellowish
Urine Ph	7
Urine -Glucose	Absence
Urine -Ketones	Absence
Urine- Bilirubin	Absence
Urine-Blood Cells	Negative
Urine - Pus cells	Negative
Mortality	Nil

Quantitative data on the body weight of rats treated with *Sarakondrai Chooranam* in Acute toxicity study

Group I	Before Treatment Weight in Gms	After Treatment Weight in Gms
Mean	182.5	185.8
Std. Deviation	6.565	6.432
Std. Error	2.68	2.626

Values are mean ± S.D (n = 6 per group). Control and treatment group were compared statistically using one way ANOVA followed by Dunnett's test.

Assessment of clinical signs in rats treated with *Sarakondrai Chooranam* on Sub-Acute toxicity study

Parameter	Group I	Group II	Group III
Clinical Signs Parameters for the duration of 28 days	Control	Test Drug 200mg/ Kg	Test Drug 400mg/ Kg
Number of animals observed	3 Male and 3 Female	3 Male and 3 Female	3 Male and 3 Female
Lacrimation	Absence	Absence	Absence
Salivation	Absence	Absence	Absence
Animal appearance	Normal	Normal	Normal
Tonic Movement	Absence	Absence	Absence
Clonic Movement	Absence	Absence	Absence
Laxative action	Absence	Absence	Moderate
Touch Response	Normal	Normal	Normal
Response to Sound	Normal Response	Normal Response	Normal Response
Response to Light	Normal Response	Normal Response	Normal Response
Mobility	Normal	Normal	Normal
Respiratory Distress	Nil	Nil	Nil
Skin Color	Normal	Normal	Normal
Stereotype behavior	Absence	Absence	Absence
Piloerection	Absence	Absence	Absence
Limb Paralysis	Absence	Absence	Absence
Posture	Normal	Normal	Normal
Open field behavior	Normal	Normal	Normal
Gait Balancing	Normal	Normal	Normal
Freezing Behaviour	Absent	Absent	Absent
Sings of Stress and Anxiety	None Observed	None Observed	None Observed

Muscular coordination	Normal	Normal	Normal
Muscle grip	Normal	Normal	Normal
Sedation	Absence	Absence	Absence
Social Behavior	Normal	Normal	Normal
Urine Analysis	No Abnormality	No Abnormality	No Abnormality
Urine Colour	Yellowish	Yellowish	Yellowish
Urine pH	7	6	6
Urine - Glucose	Absence	Absence	Absence
Urine - Ketones	Absence	Absence	Absence
Urine- Bilirubin	Absence	Absence	Absence
Urine-Blood Cells	Negative	Negative	Negative
Urine - Pus cells	Negative	Negative	Negative
Mortality	Nil	Nil	Nil

Effect of *Sarakondrai Chooranam* on Body weight of Rats in Sub-acute toxicity study

Group I	**Before Treatment Weight in Gms**	**After Treatment Weight in Gms**
Mean	187.3	198.7
Std. Deviation	5.645	6.408
Std. Error	2.305	2.616
Group II	**Before Treatment Weight in Gms**	**After Treatment Weight in Gms**
Mean	185.3	197.3
Std. Deviation	3.933	4.082
Std. Error	1.606	1.667
Group III	**Before Treatment**	**After Treatment Weight in Gms**
Mean	180.3	192.7
Std. Deviation	6.377	6.802
Std. Error	2.603	2.777

Values are mean ± S.D (n = 6 per group of which 3 males and 3 females). Control and treatment groups were compared statistically using one way ANOVA followed by Dunnett's test.

Quantitative data on the food and water intake of rats treated with *Sarakondrai Chooranam* for 28 days in Sub-acute toxicity study

GROUP I	Food intake	Water intake
Mean	19.25	41.25
Std. Deviation	3.072	1.371
Std. Error	1.536	0.6855
GROUP II	**Food intake**	**Water intake**
Mean	18.25	27.75
Std. Deviation	2.846	1.316
Std. Error	1.423	0.6579
GROUP III	**Food intake**	**Water intake**
Mean	16.83	39.25
Std. Deviation	3.491	1.344
Std. Error	1.745	0.6719

Values are mean ± S.D (n = 6 per group of which 3 males and 3 females). Control and treatment groups were compared statistically using one way ANOVA followed by Dunnett's test.

Effect of *Sarakondrai Chooranam* on Haematology profile of rats in sub-acute toxicity study.

GROUP I	**WBC count ($\times 10^3$ µl)**	**RBC ($\times 10^6$ µl)**	**PLT ($\times 10^3$ µl)**	**MCV (fl)**	**MCH (pg)**	**MCHC (g/dl)**	**HGB (g/dl)**
Mean	13.5	7.217	684.3	63.22	19.37	31.47	11.88
Std. Deviation	1.536	1.559	90.86	4.269	3.838	2.083	2.109
Std. Error	0.6272	0.6364	37.09	1.743	1.567	0.8504	0.8612
GROUP II	**WBC count ($\times 10^3$ µl)**	**RBC ($\times 10^6$ µl)**	**PLT ($\times 10^3$ µl)**	**MCV (fl)**	**MCH (pg)**	**MCHC (g/dl)**	**HGB (g/dl)**
Mean	9.983	6.417	764.3	59.12	20.37	32.65	11.1
Std. Deviation	1.495	1.294	137.4	6.003	1.283	1.528	1.231
Std. Error	0.6101	0.5282	56.1	2.451	0.5239	0.6238	0.5027

GROUP III	WBC count ($\times 10^3$ µl)	RBC ($\times 10^6$ µl)	PLT ($\times 10^3$ µl)	MCV (fl)	MCH (pg)	MCHC (g/dl)	HGB (g/dl)
Mean	11.08	7.033	511.8	61.12	23.03	32.12	11.65
Std. Deviation	2.227	1.559	98.96	5.253	3.16	1.552	2.593
Std. Error	0.909	0.6365	40.4	2.145	1.29	0.6337	1.059

Values are mean ± S.D (n = 6 per group of which 3 males and 3 females). Control and treatment groups were compared statistically using one way ANOVA followed by Dunnett's test.

Effect of *Sarakondrai Chooranam* on Haematology profile of rats in sub-acute toxicity study.

GROUP I	Lymph (%)	Mon (%)	Neutrophils (X 10^3/mm^3)	Eosinophils (%)	Basophils (%)	MPV (fl)
Mean	70.74	2.1	2.533	1.3	0.5	6.267
Std. Deviation	6.62	0.7874	1.001	0.2828	0.5477	1.283
Std. Error	2.702	0.3215	0.4088	0.1155	0.2236	0.5239
GROUP II	**Lymph (%)**	**Mon (%)**	**Neutrophils (X 10^3/mm^3)**	**Eosinophils (%)**	**Basophils (%)**	**MPV (fl)**
Mean	70.92	3.9	1.967	1.633	0.1667	6.983
Std. Deviation	5.513	1.345	0.7528	0.3445	0.4082	0.8495
Std. Error	2.251	0.5489	0.3073	0.1406	0.1667	0.3468
GROUP III	**Lymph (%)**	**Mon (%)**	**Neutrophils (X 10^3/mm^3)**	**Eosinophils (%)**	**Basophils (%)**	**MPV (fl)**
Mean	72.65	2.55	2.383	1.343	0.3333	6.65
Std. Deviation	8.053	1.346	1.098	0.343	0.5164	1.013
Std. Error	3.288	0.5494	0.4483	0.14	0.2108	0.4137

Values are mean ± S.D (n = 6 per group of which 3 males and 3 females). Control and treatment groups were compared statistically using one way ANOVA followed by Dunnett's test.

Effect of *Sarakondrai Chooranam* on Serum Bio-chemistry profile of rats in sub-acute toxicity study

GROUP I	**Blood sugar ® (mg/dl)**	**BUN (mg/dl)**	**Serum creatinine (mg/dl)**	**Serum total cholesterol (mg/dl)**	**Serum triglycerides level (mg/dl)**	**Serum HDL cholesterol (mg/dl)**	**Serum LDL cholesterol (mg/dl)**	**Serum VLDL cholesterol (mg/dl)**
Mean	86.17	11.17	0.6167	117.2	80.67	68.67	29.67	16.82
Std. Deviation	8.931	3.251	0.2994	16.98	11.93	12.45	17.75	1.707
Std. Error	3.646	1.327	0.1222	6.93	4.869	5.084	7.246	0.6969

GROUP II	**Blood sugar ® (mg/dl)**	**BUN (mg/dl)**	**Serum creatinine (mg/dl)**	**Serum total cholesterol (mg/dl)**	**Serum triglycerides level (mg/dl)**	**Serum HDL cholesterol (mg/dl)**	**Serum LDL cholesterol (mg/dl)**	**Serum VLDL cholesterol (mg/dl)**
Mean	94.17	12.5	0.75	105.5	81.83	69.17	26	13.6
Std. Deviation	6.432	3.017	0.2074	17.83	11.51	9.496	5.404	2.589
Std. Error	2.626	1.232	0.08466	7.279	4.7	3.877	2.206	1.057
GROUP III	**Blood sugar ® (mg/dl)**	**BUN (mg/dl)**	**Serum creatinine (mg/dl)**	**Serum total cholesterol (mg/dl)**	**Serum triglycerides level (mg/dl)**	**Serum HDL cholesterol (mg/dl)**	**Serum LDL cholesterol (mg/dl)**	**Serum VLDL cholesterol (mg/dl)**
Mean	76.67	16.5	0.75	119.3	70.83	47.67	53.67	19.05
Std. Deviation	14.17	4.764	0.2168	18.38	8.75	4.412	7.789	4.723
Std. Error	5.783	1.945	0.08851	7.504	3.572	1.801	3.18	1.928

Values are mean ± S.D (n = 6 per group of which 3 males and 3 females). Control and treatment groups were compared statistically using one way ANOVA followed by Dunnett's test.

Effect of *Sarakondrai Chooranam* on Serum Bio-chemistry profile of rats in sub-acute toxicity study

GROUP I	**Serum total protein (g/dl)**	**Serum albumin (g/dl)**	**(AST) (IU/ml)**	**(ALT) (IU/L)**	**(ALP) (IU/L)**
Mean	4.917	3.717	99.5	32.83	247
Std. Deviation	2.043	1.08	22.51	10.57	20.91
Std. Error	0.834	0.4408	9.19	4.316	8.536
GROUP II	**Serum total protein (g/dl)**	**Serum albumin (g/dl)**	**(AST) (IU/ml)**	**(ALT) (IU/L)**	**(ALP) (IU/L)**
Mean	5.5	2.983	107.8	21.33	107.2
Std. Deviation	0.7668	0.6242	19.96	6.772	18.13
Std. Error	0.313	0.2548	8.15	2.765	7.4
GROUP III	**Serum total protein (g/dl)**	**Serum albumin (g/dl)**	**(AST) (IU/ml)**	**(ALT) (IU/L)**	**(ALP) (IU/L)**
Mean	4.917	2.267	134.5	39.83	158.8
Std. Deviation	1.356	0.4844	5.822	7.305	72.28
Std. Error	0.5534	0.1978	2.377	2.982	29.51

Values are mean ± S.D (n = 6 per group of which 3 males and 3 females). Control and treatment groups were compared statistically using one way ANOVA followed by Dunnett's test.

Quantitative data on absolute organ weight of rats treated with *Sarakondrai Chooranam* for 28 days in Sub-acute toxicity study.

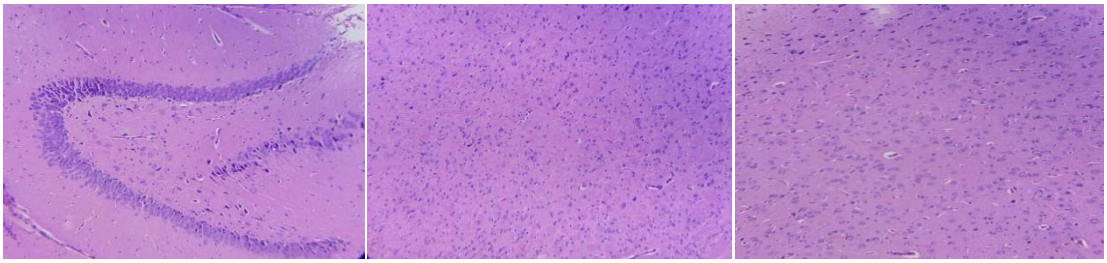
GROUP I	**HEART (gms)**	**LIVER (gms)**	**KIDNEYS (gms)**	**SPLEEN (gms)**	**BRAIN (gms)**	**LUNG (gms)**	**STOMACH (gms)**	**TESTES (gms)**	**UTERUS & OVARY (gms)**
Mean	0.5417	6.62	1.507	0.4	1.667	1.633	1.183	2.533	1.133
Std. Deviation	0.05269	0.7811	0.1987	0.1265	0.1751	0.1633	0.2639	0.9074	0.4041
Std. Error	0.02151	0.3189	0.0811	0.05164	0.07149	0.06667	0.1078	0.5239	0.2333

GROUP II	HEART (gms)	LIVER (gms)	KIDNEYS (gms)	SPLEEN (gms)	BRAIN (gms)	LUNG (gms)	STOMACH (gms)	TESTES (gms)	UTERUS & OVARY (gms)
Mean	0.6967	5.203	1.505	0.6333	1.75	1.7	1.25	3.033	1.367
Std. Deviation	0.1071	0.665	0.1634	0.1633	0.1761	0.1549	0.2881	0.5859	0.2082
Std. Error	0.04372	0.2715	0.06672	0.06667	0.07188	0.06325	0.1176	0.3383	0.1202
GROUP III	**HEART (gms)**	**LIVER (gms)**	**KIDNEYS (gms)**	**SPLEEN (gms)**	**BRAIN (gms)**	**LUNG (gms)**	**STOMACH (gms)**	**TESTES (gms)**	**UTERUS & OVARY (gms)**
Mean	0.68	7.173	1.322	0.6167	1.65	1.6	1.417	2.633	1.2
Std. Deviation	0.1471	0.5425	0.1933	0.1169	0.1049	0.3286	0.4167	0.8327	0.1
Std. Error	0.06006	0.2215	0.07893	0.04773	0.04282	0.1342	0.1701	0.4807	0.05774

Values are mean ± S.D (n = 6 per group of which 3 males and 3 females) for Heart, Liver, Kidney, Brain, Spleen, Lung, Stomach. Values are mean ± S.D (n = 3 per group per sex) for testes, ovary and uterus for Control and treatment groups were compared statistically using one way ANOVA followed by Dunnett's test.

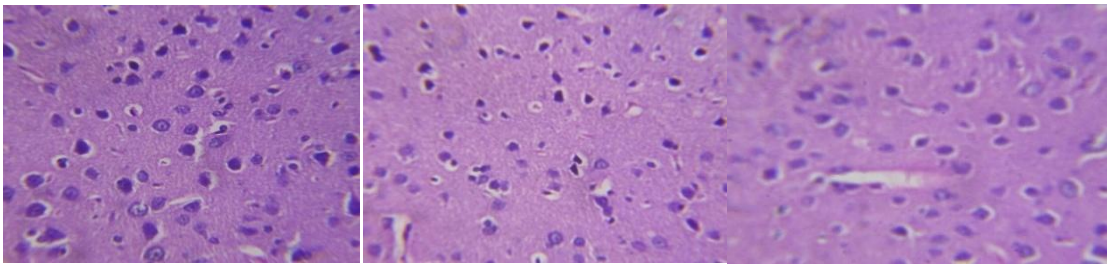
Histopathology of Brain (Female Rat) in Sub-acute toxicity Study

Low Power Magnification 10X



GROUP I **GROUP II** **GROUP III**

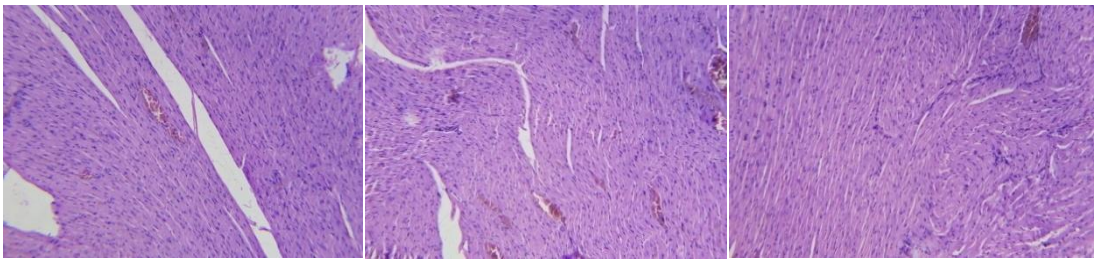
High Power Magnification 40X



GROUP I **GROUP II** **GROUP III**

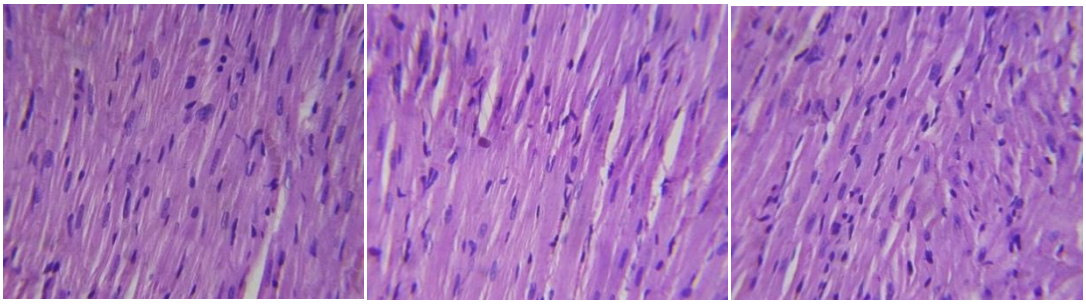
Histopathology of Heart (Female Rat) in Sub-acute toxicity Study

Low Power Magnification 10X



GROUP I **GROUP II** **GROUP III**

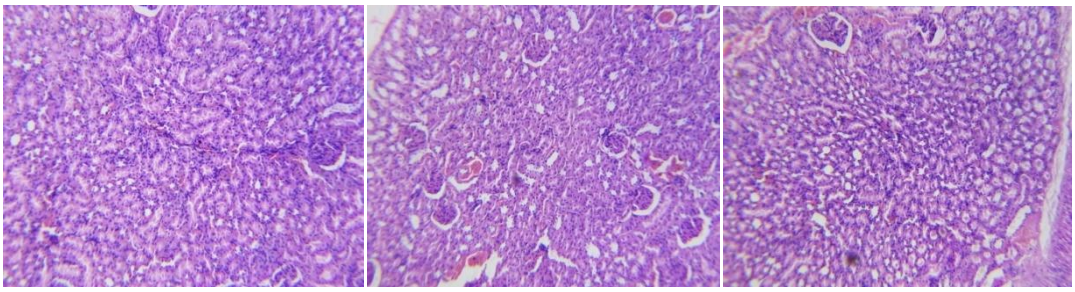
High Power Magnification 40X



GROUP I **GROUP II** **GROUP III**

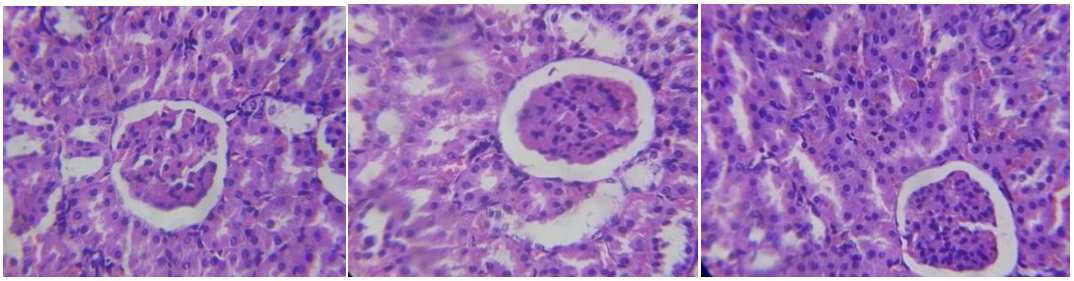
Histopathology of Kidney (Female Rat) in Sub-acute toxicity Study

Low Power Magnification 10X



GROUP I **GROUP II** **GROUP III**

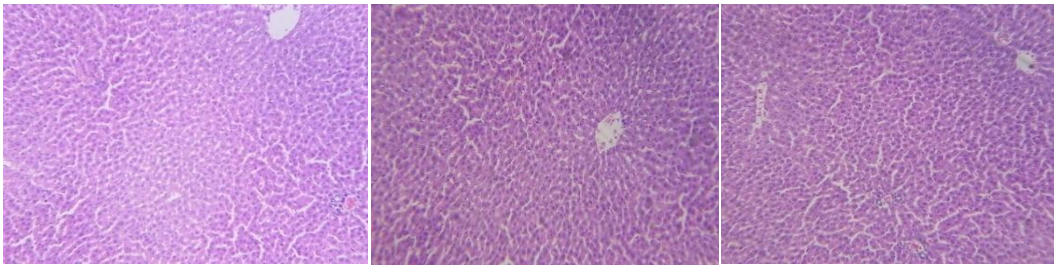
High Power Magnification 40X



GROUP I **GROUP II** **GROUP III**

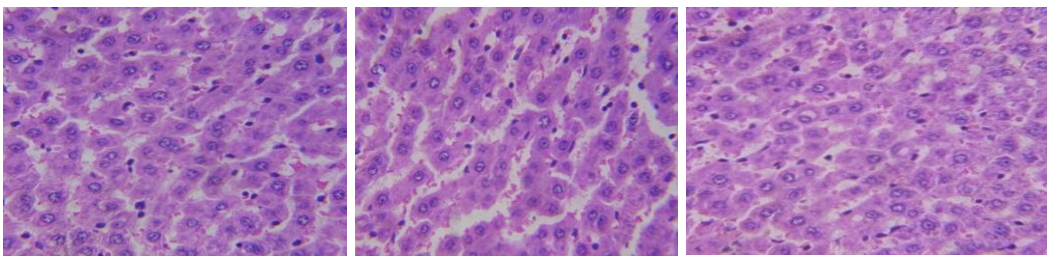
Histopathology of Liver (Female Rat) in Sub-acute toxicity Study

Low Power Magnification 10X



GROUP I **GROUP II** **GROUP III**

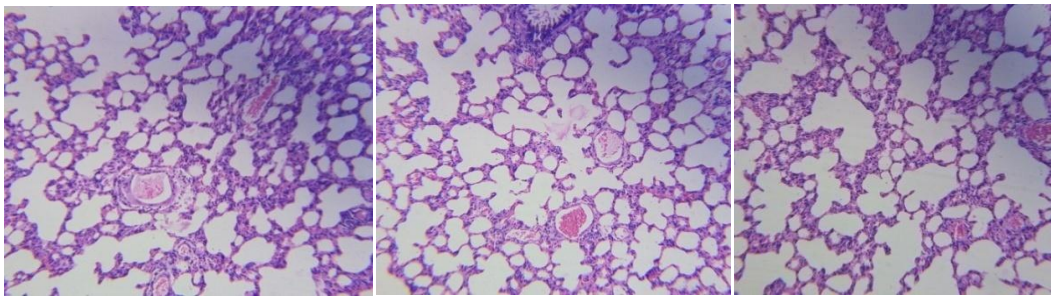
High Power Magnification 40X



GROUP I **GROUP II** **GROUP III**

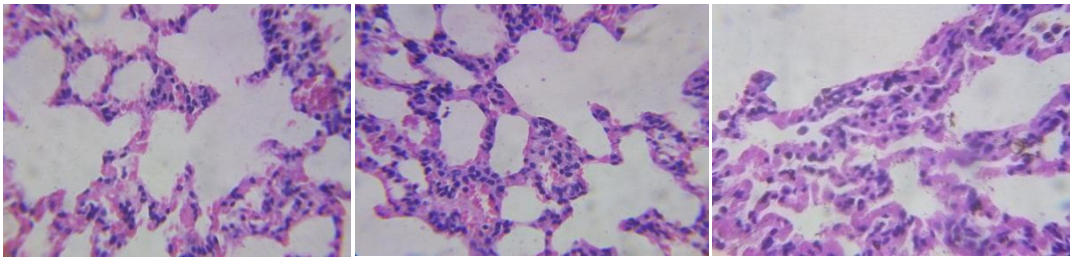
Histopathology of Kidney (Female Rat) in Sub-acute toxicity Study

Low Power Magnification 10X



GROUP I **GROUP II** **GROUP III**

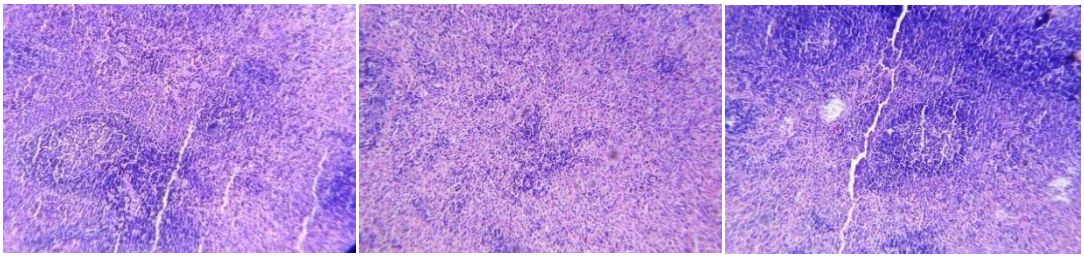
High Power Magnification 40X



GROUP I **GROUP II** **GROUP III**

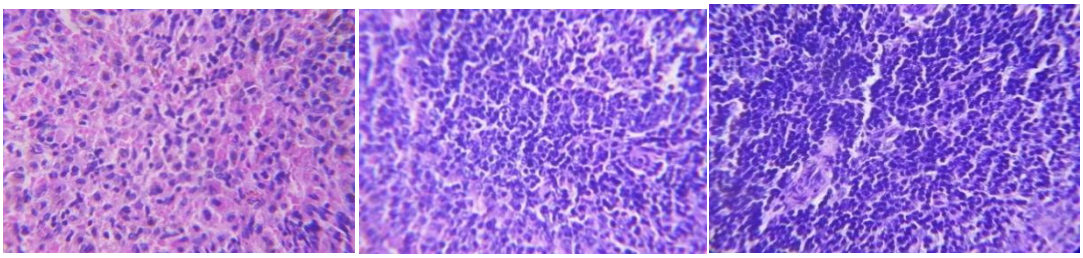
Histopathology of Spleen (Female Rat) in Sub-acute toxicity Study

Low Power Magnification 10X



GROUP I **GROUP II** **GROUP III**

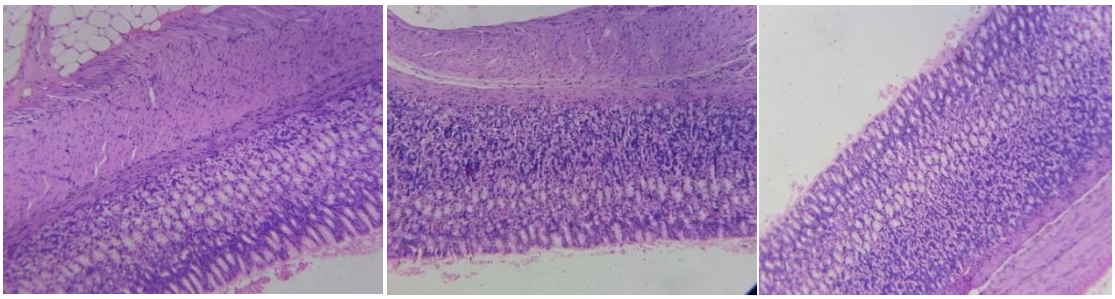
High Power Magnification 40X



GROUP I **GROUP II** **GROUP III**

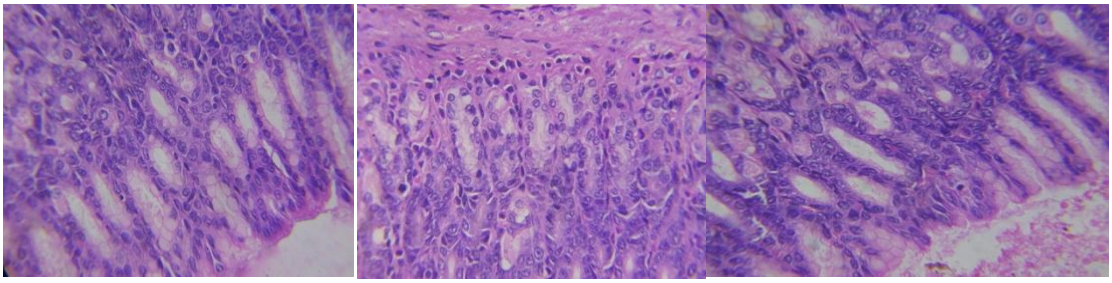
Histopathology of Stomach (Female Rat) in Sub-acute toxicity Study

Low Power Magnification 10X



GROUP I **GROUP II** **GROUP III**

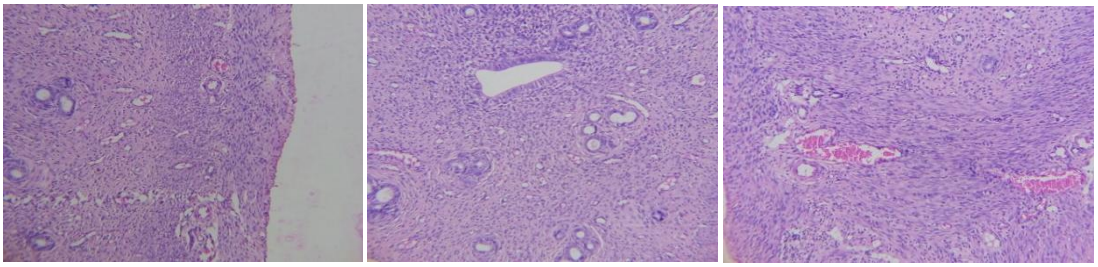
High Power Magnification 40X



GROUP I **GROUP II** **GROUP III**

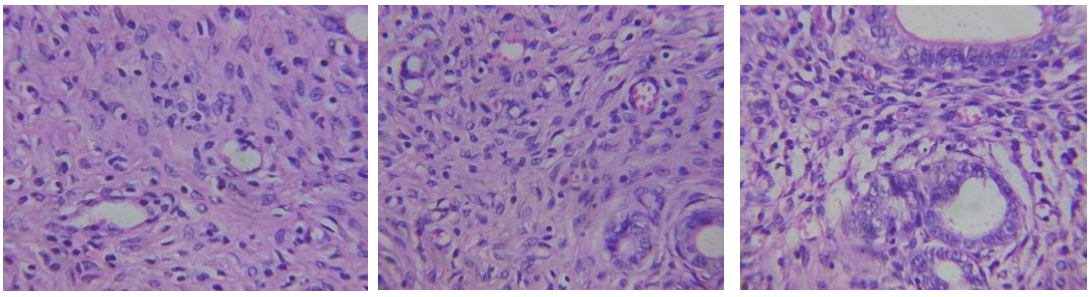
Histopathology of Uterus (Female Rat) in Sub-acute toxicity Study

Low Power Magnification 10X



GROUP I **GROUP II** **GROUP III**

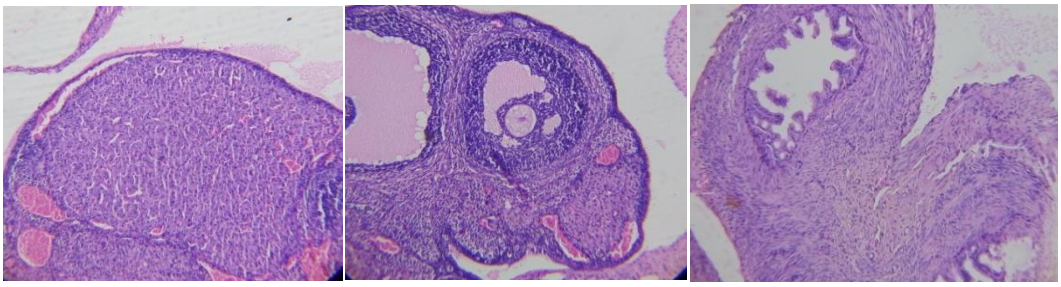
High Power Magnification 40X



GROUP I **GROUP II** **GROUP III**

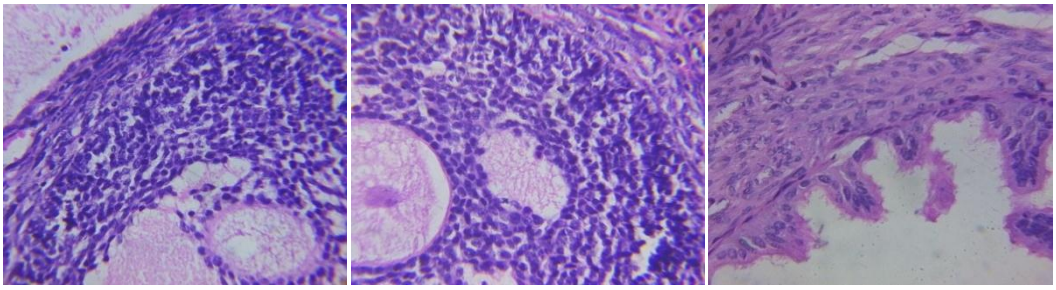
Histopathology of Ovary (Female Rat) in Sub-acute toxicity Study

Low Power Magnification 10X



GROUP I **GROUP II** **GROUP III**

High Power Magnification 40X



GROUP I **GROUP II** **GROUP III**

Effect of SKC on Hematology Profile of Phenyl hydrazine induced Anaemic rats.

GROUP I	**RBC ($\times 10^6$ µl)**	**WBC ($\times 10^3$ µl)**	**HGB (g/dl)**	**HCT (%)**
Mean	7.417	8.05	12.67	48
Std. Deviation	0.4916	0.5128	1.211	3.033
Std. Error	0.2007	0.2094	0.4944	1.238
GROUP II	**RBC ($\times 10^6$ µl)**	**WBC ($\times 10^3$ µl)**	**HGB (g/dl)**	**HCT (%)**
Mean	4.517	6.133	7	19
Std. Deviation	0.5672	0.3266	0.8944	1.414
Std. Error	0.2315	0.1333	0.3651	0.5774
GROUP III	**RBC ($\times 10^6$ µl)**	**WBC ($\times 10^3$ µl)**	**HGB (g/dl)**	**HCT (%)**
Mean	5.567	7.217	8.667	24
Std. Deviation	0.2251	0.3189	0.8165	2.098
Std. Error	0.09189	0.1302	0.3333	0.8563
GROUP IV	**RBC ($\times 10^6$ µl)**	**WBC ($\times 10^3$ µl)**	**HGB (g/dl)**	**HCT (%)**
Mean	6	7.7	10.67	29.33
Std. Deviation	0.2449	0.3578	1.033	2.066
Std. Error	0.1	0.1461	0.4216	0.8433

Values are mean ± S.D / S.E (n = 6 per group)

CERTIFICATE

This is to certify that the project entitled "**PHARMACOLOGICAL EVALUATION OF SARAKONDRAI CHOORNAM ON PHENYL HYDRAZINE INDUCED ANAEMIA IN WISTER RATS.**" has been approved by the Institutional Animal Ethics Committee of Sathyabama University, Chennai.

IAEC Approval No.: **SU/CLATR/IAEC/VII/052/2016**
Principal Investigator: Dr. M. Shanmuga Priya
Animal Sanctioned: *Rattus norvegicus* / Wistar albino rats
Female: 24; Total: 24 (Twenty Four)
Date: 05.10.2016

B. Sheela Rani

DR. B. SHEELA RANI
Chairperson

DR. R. ILAVARASAN
CPCSEA Nominee

Pharmacological Evaluation of *Sarakondrai Chooranam* on Phenyl hydrazine induced Anaemia in wistar rats.

Name: Dr.M.Shanmuga priya

IAEC: SU/CLATR/IEAC/VII/052/2016

Animals

Healthy adult Wistar albino female rats weighing between 220-240 g were used for the study. The animals were housed in poly propylene cages and were kept in well ventilated with 100% fresh air by air handling unit. A 12 light / dark cycle were maintained. Room temperature was maintained between 22 $\pm$ 2^{o} C and relative humidity 50–65%. They were provided with food (Sai feeds, Bangalore, India) and water *ad libitum*. All the animals were acclimatized to the laboratory for 7 days prior to the start of the study.The experimental protocol was approved by The Institutional Animal Ethics Committee of Sathyabama University, Chennai, Tamil Nadu, India.

IAEC: SU/CLATR/IEAC/VII/052/2016.

Experimental Methodology

Animal belongs to group I received normal saline 5ml/kg. Group II rats were treated with Phenylhydrazine (PHZ) 40 mg / kg (i.p) for two days (Day1 and Day 2) and were served as disease control. Animal belongs to group III received PHZ injection 40mg/kg (i.p) and treated with 200 mg/kg *Sarakondrai Chooranam* from 3rd to 16th Day. Whereas animal belongs to group IV treated with 400 mg/kg *Sarakondrai Chooranam* from 3rd to 16th Day and served as treatment group.

Induction of Anaemia

Induction of Anaemia in rats was performed by intraperitoneal administration of 40mg/kg of phenylhydrazine (PHZ) for two days (Day1 and Day2).

Sample Collection

At the end of the study, before sacrifice, the animals were fasted for overnight with free access to water. Animals were sacrificed with excess anesthesia. Blood samples were collected from retro orbital sinus puncture and stored in EDTA (ethylenediamine –tetra acetate) test tubes for Hematological analysis. Bone marrow of control and treatment group animals were collected using fine needle aspiration technique for further processing.

Biochemical Parameter

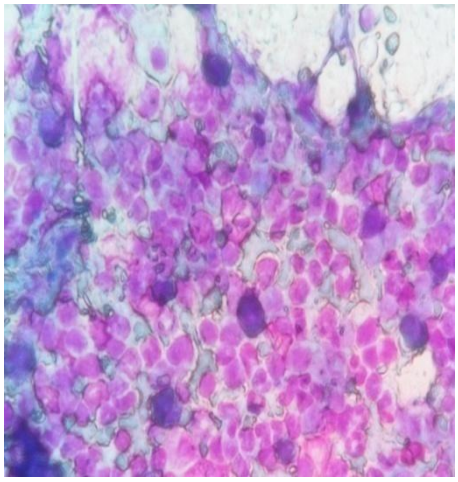
At the end of the study blood will be collected by ocular puncture after overnight fasting animals. The blood parameters such as red blood cell count (RBC), white blood cell count (WBC), haemoglobin concentration (Hb) and haematocrit was determined using Mindray BC 2800 hematology analyzer.

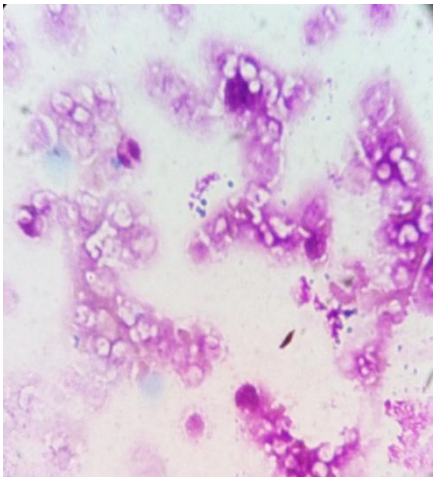
Bone Marrow Smear

About 0.2 ml of smear aspirated from the femur thigh bone of the experimental animal was dropped onto the glass slide and made into thin smear allow the smear to dry. Dried smear was stained with leishman stain and washed. Followed by this cedar wood oil was placed on to the smear and was observed microscopically.

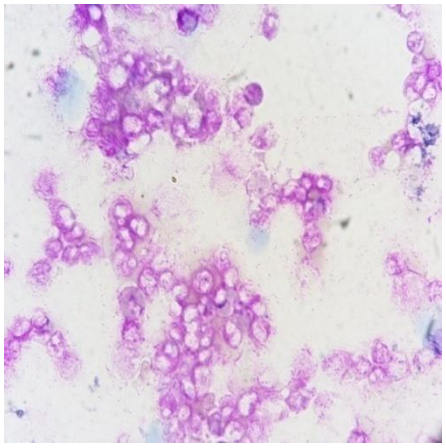
Microscopic View of Bone Marrow Smear of control and treatment group rats

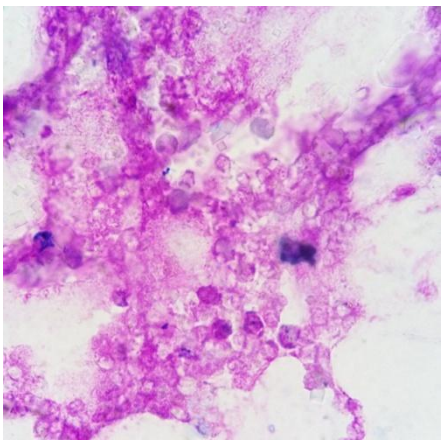
Control Sample **Phenyl hydrazine induced Group**





Phenyl hydrazine + 200mg/kg of SKC **Phenyl hydrazine + 400mg/kg of SKC**





PATHOLOGY REPORT

- Bulky marrow with dense cellular portions were observed and active zones of erythropoiesis were observed in sample belongs to group I. Bone marrow smear of group I reveals normal Eosinophilic myelocyte and basophilic myelocyte.
- Hyperplasic condition of marrow with increased adipocyte cells replaced the marrow space was observed. Megakaryocyte appears very minimal in number with erythroid precursors, and granulocytic precursors was observed in sample belongs to group II.
- Increased network of erythroblastic islets were observed, Central reticular cells appears normal long and slender in nature. Increased number of erythroblastic islets with wavy zone of erythropoiesis was observed in sample belongs to group III and IV.

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सिद्ध केंद्रीय अनुसन्धान संस्थान,
अण्णा सरकारी अस्पताल परिसर, अरुम्बाक्कम, चेन्नई – 600 106
SIDDHA CENTRAL RESEARCH INSTITUTE
(Central Council for Research in Siddha, Ministry of AYUSH, Govt. of India)
Anna Govt. Hospital Campus, Arumbakkam, Chennai – 600106
Phone: 044-2621 4925, Fax: 044-2621 4809

20.1.2017

CERTIFICATE

Name of the student: Dr. M. Shanmuga Priya, II year PG student, Pothu Maruthuvam, Government Siddha Medical College, Arumbakkam, Chennai-600 106.

Name of the sample: Sarakondrai Chooranam

Name of the Experiment	I	II	Mean
Loss on drying (at 105°C)	11.13 %	11.01 %	11.07 %
Total ash	9.25 %	9.44 %	9.34 %
Water soluble ash	4.62 %	4.65 %	4.63 %
Acid insoluble ash	1.97 %	1.87 %	1.92 %
Water soluble extractive	31.81 %	31.13 %	31.47 %
Alcohol soluble extractive	24.8 %	24.7 %	24.75 %
pH value (10%)	4.88	4.90	4.89
TLC/HPTLC	Report Enclosed		

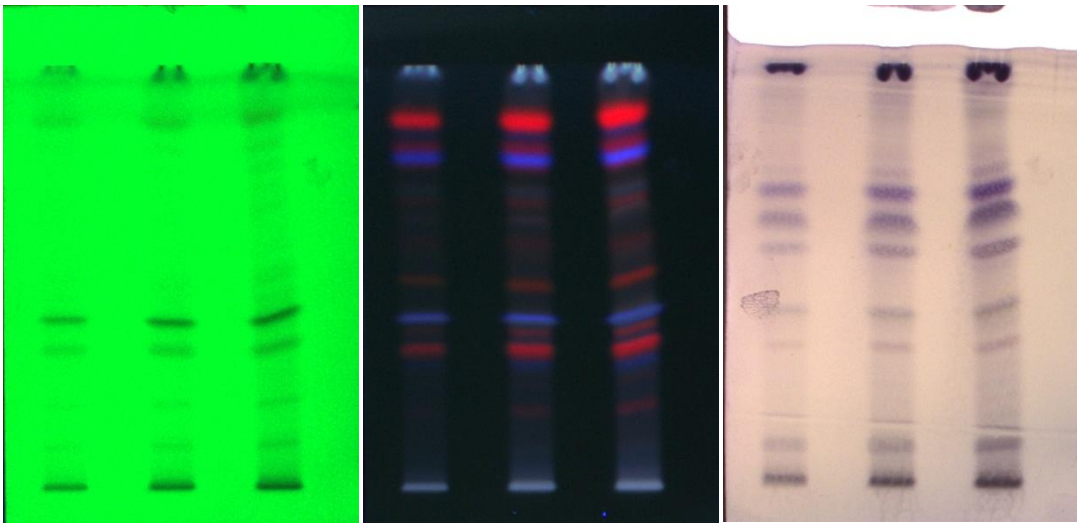
(R. Shakila)
Research Officer (Chemistry) & Head,
Department of Chemistry

(Dr. P. Elankani) 21/01/17
Research Officer (Scientist II) (Siddha)
for Assistant Director (Siddha) I/c

Sarakondrai chooranam chloroform extract

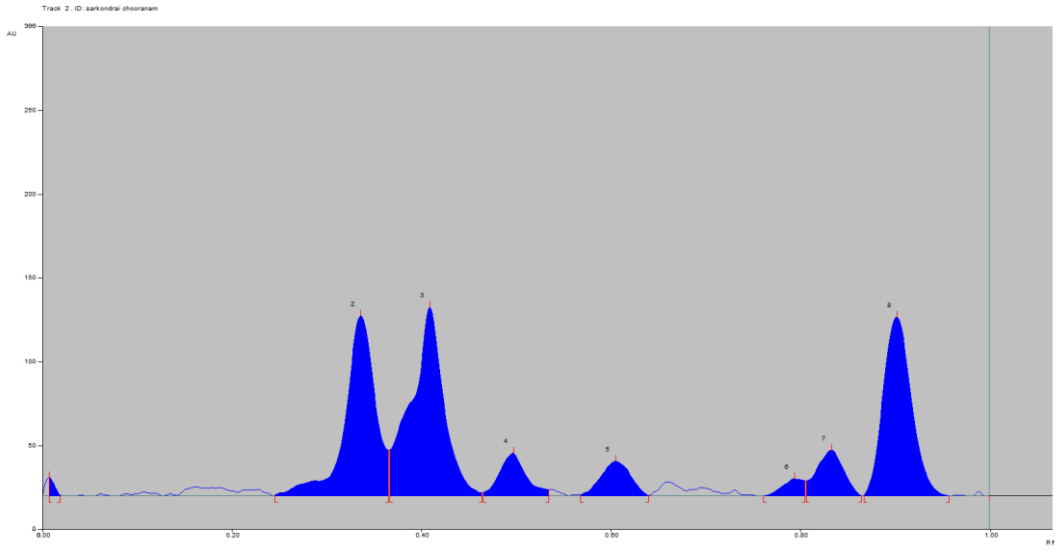
Stationary Phase - Silica Gel 60 F_{254}

Mobile Phase - Toluene : Ethyl acetate : (5:1 v/v)



UV 254 nm		UV 366 nm		575 nm (Derivatized)	
Color	**R_f value(s)**	**Color**	**R_f value(s)**	**Color**	**R_f value(s)**
Green	0.02	Ash	0.03	Grey	0.02
Green	0.11	Maroon	0.21	Light Ash	0.10
Green	0.21	Blue	0.31	Light Pink	0.35
Green	0.34	Red	0.36	Light Blue	0.43
Green	0.42	Red	0.39	Light Blue	0.56
Green	0.87	Sky Blue	0.41	Light Blue	0.66
Green	0.98	Maroon	0.51	Violet	0.72
		Light Red	0.60	Grey	0.75
		Light Red	0.68	Black	0.97
		Ash	0.72		
		Pink	0.76		
		Sky Blue	0.80		
		Maroon	0.82		
		Red	0.88		
		Ash	0.98		

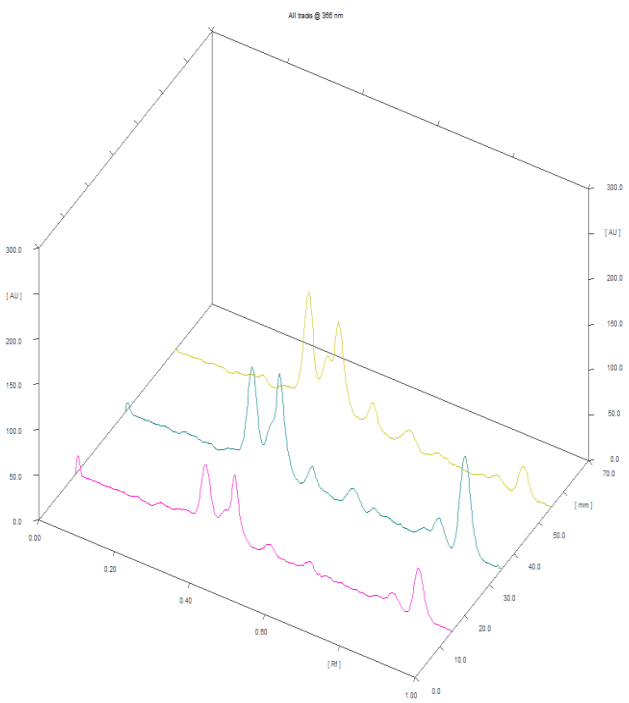
HPTLC Chromatogram @ 366 nm:



Peak Table @ 366 nm:

Peak	Start Position	Start Height	Max Position	Max Height	Max %	End Position	End Height	Area	Area %
1	0.01 Rf	10.9 AU	0.01 Rf	10.9 AU	2.59 %	0.02 Rf	0.2 AU	59.1 AU	0.53 %
2	0.25 Rf	0.2 AU	0.34 Rf	107.5 AU	25.50 %	0.37 Rf	27.3 AU	2985.2 AU	26.60 %
3	0.37 Rf	27.4 AU	0.41 Rf	112.7 AU	26.75 %	0.46 Rf	1.8 AU	3373.7 AU	30.06 %
4	0.47 Rf	1.9 AU	0.50 Rf	25.6 AU	6.07 %	0.53 Rf	3.8 AU	617.5 AU	5.50 %
5	0.57 Rf	0.7 AU	0.61 Rf	20.6 AU	4.88 %	0.64 Rf	0.3 AU	560.0 AU	4.99 %
6	0.76 Rf	0.1 AU	0.79 Rf	10.1 AU	2.40 %	0.81 Rf	9.1 AU	194.5 AU	1.73 %
7	0.81 Rf	9.1 AU	0.83 Rf	27.2 AU	6.46 %	0.87 Rf	0.1 AU	668.0 AU	5.95 %
8	0.87 Rf	0.4 AU	0.90 Rf	106.8 AU	25.35 %	0.96 Rf	0.0 AU	2765.5 AU	24.64 %

3D Chromatogram @ 366 nm:



BIO-CHEMICAL ANALYSIS OF TRIAL MEDICINE

Preparation of Sodium Carbonate extract:

2 gm of the sample drug is mixed with 5 gm of Sodium carbonate and taken in a 100 ml beaker and 20 ml of distilled water is added. The solution is boiled for 10 minutes, cooled and then filtered. The filtrate is called sodium carbonate extract.

S.No	EXPERIMENT	OBSERVATION	INFERENCE
	TEST FOR ACID RADICALS		
1. a)	**Test for Sulphate** 2ml of the above prepared extract is taken in a test tube. To this add 2ml of 4% Ammonium oxalate solution.	Absence of White Precipitate	Absent
b)	2ml of extract is added with 2ml of dilute hydrochloric acid until the effervescence ceases off. Then 2ml barium chloride solution is added.	Absence of White Precipitate	Absent
2	**Test for Chloride** 2ml of extract is added with dilute nitric acid till the effervescence ceases. Then 2ml of silver nitrate solution is added.	Absence of White Precipitate	Absent
3	**Test for Phosphate** 2ml of the extract is treated with 2 ml of Ammonium molybdate solution and 2ml of concentrated nitric acid.	Absence of Yellow precipitate	Absent
4	**Test for Carbonate** 2ml of the extract is treated with 2ml of magnesium sulphate solution.	Absence of white precipitate	Absent
5	**Test for Sulphide** 1 gm of the substance is treated with 2ml of concentrated Hcl.	Absence of Rotten egg smelling	Absent
6	**Test for Nitrate** 1gm of the substance is heated with copper turnings and concentrated	Absence of reddish brown gas.	Absent

	sulphuric acid and viewed the test tube vertically down.		
7	**Test for Fluoride and oxalate** 2ml of the extract is added with 2ml of dilute acetic acid and 2ml of calcium chloride solution and heated.	Absence of white precipitate	Absent
8	5 drops of clear solution is added with 2ml of diluted sulphuric acid and slightly warmed to this, 1 ml of dilute potassium permanganate solution is added.	Absence of KMNO4 solution Decolourisation	Absent
9	**Test for Nitrite** 3 drops of the extract is placed on a filter paper. On that, 2 drops of Acetic Acid and 2 drops of Benzidine solution is placed.	Absence of yellowish red colour	Absent
10	**Test for Borate** 2 pinches of the substance is made into paste by using Sulphuric acid and Alcohol (95%) and introduced into the blue flame.	Absence of Green tinged flame	Absent
	TEST FOR BASIC RADICALS		
1	**Test for lead** 2 ml of the extract is added with 2 ml of Potassium iodide solution.	Absence of Yellow precipitate	Absent
2.a)	**Test for Copper** One pinch of substance is made into paste with concentrated Hydrochloric acid in a watch glass and introduced into the non luminous part of the flame.	Presence of Bluish green coloured flame.	Present
b)	2ml of the extract is added with excess of Ammonia solution	Presence of deep blue colour.	Present
3	**Test for Aluminium**	Absence of White	Absent

	To the 2 ml of extract. Sodium Hydroxide solution is added in drops to excess.	Precipitate.	
4.a)	**Test for Iron** To the 2 ml of extract, 2 ml of Ammonium Thiocyanate Solution is added.	Blood red colour	Present
b)	To the 2 ml of extract, 2 ml of Ammonium Thiocyanate solution and 2 ml of concentrated Nitric Acid is added.	Blood red colour obtained	Present
5	**Test for Zinc** To the 2 ml of extract Sodium Hydroxide solution is added in drops to excess	Absence of White precipitate.	Absent
6	**Test for Calcium** 2 ml of the extract is added with 2 ml of 4% Ammonium Oxalate solution.	Absence of White Precipitate.	Absent
7	**Test for Magnesium** 2ml of extract, Sodium Hydroxide solution is added in drops to excess.	Absence of White precipitate.	Absent
8	**Test for Ammonium** 2 ml of extract few ml of Nessler's Reagent and excess of Sodium Hydroxide solution are added.	Absence of Reddish brown Precipitate	Absent
9	**Test for Potassium** A pinch of substance is treated with 2 ml of Sodium Nitrite solution and then treated with 2 ml of Cobal Nitrate in 30% glacial Acetic acid.	Absence of Yellow precipitate	Absent
10	**Test for Sodium** 2 pinches of the substance is made into paste by using Hydrochloric acid and introduced into the blue flame.	Absence of Yellow colour flame	Absent
11	**Test for Mercury**	Absence of	Absent

	2 ml of the extract is treated with 2 ml of Sodium Hydroxide solution.	yellow Precipitate	
12	**Test for Arsenic** 2 ml of extract is treated with 2 ml of silver Nitrate solution.	Absence of Yellow precipitate	Absent
13	**Test for Starch** 2ml of extract is treated with weak iodine solution	Absence of Blue colour	Absent
14	**Test of Reducing Sugar** 5ml of Benedicts qualitative solution is taken in a test tube and allowed to boil for 2 minutes and added 10 drops of the extract and again boiled for 2 minutes. The colour changes are noted.	Green colour obtained	Present
15	**Test of the alkaloids** 2ml of the extract is treated with 2ml of potassium lodide solution.	Presence of Red colour	Present
16	**Test of the proteins** 2ml of the extract is treated with 2ml of 5% NaOH, mix well and add 2 drops of copper sulphate solution.	Absence of Violet colour	Absent

RESULTS:

The given sample (Sarakondrai Chooranam) contains :

1. Iron
2. Copper
3. Reducing sugar
4. Alkaloids.

GOVERNMENT SIDDHA MEDICAL COLLEGE

Arumbakkam, Chennai-106

Communication Of The Decision Of Institutional Ethics Committee (IEC)

IEC No: GSMC-CH-ME-4/2015/011

Protocol title: A CLINICALSTUDYON PITTHA PAANDU WITH THE EVALUATION OF SIDDHA DRUG SARAKONRAI CHOORANAM	
Principal Investigator:	DR.M. SHANMUGA PRIYA
Name & Address of Institution : Government siddha medical college, Arumbakkam, Chennai-106	
☑ New Review	☐ Revised Review ☐ Expedited Review
Date of review (DD/MM/YY):	26-03-2015
Date Of Previous Review, If Revised Application :	
Decision of the IEC	
☑ Recommended	☐ Recommended with suggestions
☐ Revision	☐ Rejected
Suggestions / Reasons / Remarks : 1. In Inclusion Criteria, age should be between 18 - 50 years.	
Recommended for a period of 1 year from date of completion of preclinical studies:	

Please Note:

- Inform IEC immediately in case of any adverse events/serious drug reaction.
- Seek IECapproval in case of any change in the study procedure, site and investigator
- This approval is valid only for period mentioned above
- IEC member have the right to review the trial with prior intimation.

26/3/15.

Dr.P.Jeyaprakashnarayanan
Chairman

Dr.V. Banumathi
Member Secretary

INSTITUTIONAL ETHICS COMMITTEE

Date:

Sub: IEC review of research proposals.

Ref:Your letter dated

MEMBERS	PARTICIPATION	SIGNATURE
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26/3/15

Dr.P.Jeyaprakashnarayanan
Chairman

Dr.V.Banumathi
Member Secretary

CLINICAL PROGNOSIS

Treatment for Pitha Paandu:

The most popular non parametric statistical tool, namely, McNemar Test analysis has been employed to analyses the effectiveness with the help of a hypothesis.

S.No	Signs&Symptoms	Before Treatment	After Treatment
		n%	n%
1.	Pallor of conjunctiva and nail bed	40(100)	8(20)**
2.	Fatigue	40(100)	3(7.5)**
3.	Loss of appetite	40(100)	4(10)**
4.	Dyspnea on exertion	40(100)	6(15)**
5.	Headache	18(45)	5(12.5)**
6.	Glossitis	13(32.5)	6(15)*
7.	Constipation	20(50)	0(0)**
8.	Giddiness	20(50)	0(0)**
9.	Tachycardia	18(45)	4(10)*
10.	Dimness of vision	5(12.5)	3(7.5)

McNemat test, C.I: 95%, *P<0.05; **P<0.01

Software: spss17 version

Number of cases: 40

Inference:

Since the p value is significant in all signs and symptoms except dimness of vision. So there is significant reducing of signs & symptoms except dimness of vision among the patients for the treatment of Pitha Paandu (Iron deficiency anaemia). Hence it is concluded that the treatment was effective and **significant.**

HAEMOGLOBIN LEVEL:

Effect of Sarakondrai Chooranam on Hb level (gm/dl) in human subjects

S. no	BeforeTreatment(gms/dl)	AfterTreatment(gms/dl)
1	10.0	12.1
2	10.0	13.2
3	9.8	11.9
4	9.0	12.0
5	8.3	10.9
6	8.8	11.0
7	10.0	13.1
8	9.1	11.3
9	9.0	12.3
10	9.6	12.8
11	9.2	12.4
12	7.5	9.8
13	8.6	11.3
14	8.7	11.8
15	8.6	12.7
16	9.9	12.0
17	9.5	12.1
18	9.8	12.9
19	10.0	12.6
20	9.0	12.2
21	9.8	12.9
22	8.6	11.8
23	10.0	13.2
24	10.0	12.6
25	10.0	12.9
26	9.5	12.5
27	8.0	11.1
28	10.0	13.2
29	10.0	13.1
30	9.9	12.9
31	10.0	13.3
32	10.0	12.9

33	9.8	12.6
34	10.0	12.2
35	8.0	11.1
36	10.0	13.5
37	7.6	8.8
38	10.0	12.9
39	10.0	13.0
40	8.8	10.4

Software: spss17 version

Variables: Hb level (gm/dl) – before treatment, after treatment

Number of cases: 40

Test: Paired t test

Confidence Interval: 95%

Correlation coefficient (r): 0.897

Before and after treatment mean difference ± SEM: 2.92± 0.07.

P Value (2 tailed): $p<0.001$.

Inference:

Since the P value is highly significant (<0.001), the hypothesis is **not** accepted. So the treatment was significantly improving the Hb level among the patients for the treatment of Pitha Paandu.

அரசினர் சித்த மருத்துவக் கல்லூரி, சென்னை-106.

அறிஞர் அண்ணா மருத்துவமனை, சென்னை-106

பித்த பாண்டு நோய்க்கான சித்த மருந்தின் (**சரக்கொன்றை சூரணம்**) பரிகரிப்பு திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கான நோயாளியின் தகவல் படிவம்.

ஒப்புதல் படிவம்.

ஆய்வாளரால் சான்றளிக்கப்பட்டது.

நான் இந்த ஆய்வை குறித்த அனைத்து விபரங்களையும் நோயாளிக்குப் புரியும் வகையில் எடுத்துரைத்தேன்.

தேதி: கையொப்பம்:

இடம்: பெயர்:

நோயாளியின் ஒப்புதல்

என்னிடம் இந்த மருத்துவ ஆய்வின் காரணத்தையும், மருந்தின் தன்மையையும், மருத்துவ வழிமுறையையும் மற்றும் தொடர்ந்து எனது உடல் இயக்கத்தை கண்காணிக்கவும், அதனை பாதுகாக்கவும் பயன்படும் மருத்துவ ஆய்வுக்கூட பரிசோதனைகள் பற்றி திருப்தி அளிக்கும் வகையில் ஆய்வு மருத்துவரால் விளக்கிக் கூறப்பட்டது.

நான் இந்த மருத்துவ ஆய்வின் போது , காரணம் எதுவும் கூறாமல், எப்போது வேண்டுமானாலும் இந்த ஆய்விலிருந்து என்னை விடுவித்துக் கொள்ளும் உரிமையை தெரிந்திருக்கிறேன். நான் என்னுடைய சுதந்திரமாக தேர்வு செய்யும் உரிமையைக் கொண்டு பித்த பாண்டு நோய்க்கான **சரக்கொன்றை சூரணம்** பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கு என்னை உட்படுத்த ஒப்புதல் அளிக்கிறேன்.

தேதி: கையொப்பம்:

இடம்: பெயர்:

சாட்சிக்காரர் கையொப்பம்:

பெயர்:

உறவுமுறை:

துறைத்தலைவர் கையொப்பம்: ஆய்வாளர் கையொப்பம்:

GOVERNMENT SIDDHA MEDICAL COLLEGE

ARIGNAR ANNA GOVERNMENT HOSPITAL OF INDIAN MEDICINE

CHENNAI – 600 106

A CLINICAL STUDY ON

"SARAKONDRAI CHOORANAM" IN THE TREATMENT

OF "PITHA PAANDU"("Iron deficiency anaemia").

INFORMED CONSENT FORM

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have asked have been answered to my satisfaction.

I consent voluntarily to participate in this study and understand that I have the right to withdraw from the study at any time without in any way it affecting my further medical care.

I have received a copy of the information sheet/consent form.

Date:

Station:

Signature of the Participant:

Signature of the Guide: **Signature of the Investigator**

CASE SHEET PROFORMA FOR PITHA PAANDU

GOVT.SIDDHA MEDICAL COLLEGE & HOSPITAL

CHENNAI-106

POST GRADUATE DEPARTMENT BRANCH –I MARUTHUVAM

Duration: 2015-2017

Op No / Ip No	:	Occupation	:
Ward No	:	Income	:
Bed No	:	Nationality	:
Name	:	Religion	:
Age	:	D.O.A	:
Sex	:	D.O.D	:
Address	:	Diagnosis	:

1. Complaints and duration :

2. History of present illness :

3. History of past illness :

4. Personal history :

5. Occupational history :

6. Menstrual history :

7. Personal Habits :Veg/nonveg/smoker/Alcoholic/Tobacco chewer

8. Family History :

GENERAL EXAMINATION

Patient consciousness :

Body Built :

Nourishment :

Pallor :

Jaundice :

Cyanosis :

Clubbing :

JVP :

Tracheal deviation :

Pedal oedema :

Lymph adenopathy :

Vital Signs

Body Temp :

Pulse :

Respiratory rate :

Blood Pressure :

Weight :

SIDDHA ASPECT

NILAM

Kurinchi :

Mullai :

Marutham :

Neithal :

Palai :

PARUVA KALAM

Kaar :

Koothir :

Munpani :

Pinpani :

Elavenil :

Muduvenil :

YAAKKAI (Udal)

Vaatham :

Pittham :

Kabam :

Kalappu :

GUNAM

Satthuvam :

Rajotham :

Thamasam :

PORI/PULANGAL (SENSORY ORGANS)

Mei –Sensation :

Vaai – Taste :

Kan – Vision :

Mooku - Smell :

Sevi – Hearing :

KANMENTHRIYAM/KANNMA VIDAYAM [MOTOR ORGANS]

Kai- Dhaanam :

Kaal-Kamanam :

Vaai-Vasanam :

Eruvaai- Visarkkam :

Karuvaai-Aanantham :

UTHKAAYA ATHAKAAYAM

Puyam[forearm] :

Sayam[arm] :

Kaal[leg] :

Paaatham[feet] :

UYIR THATHUKKAL

A.VATHAM

Piranan :

Abanan :

Viyanan :

Udanan :

Samanan :

Nagan :

Koorman :

Kirukaran :

Devathathan :

Thananjeyan :

B.PITHAM

Anar pitham :

Ranjaga pitham :

Saathaga pitham :

Pirrasaga pitham :

Alosaga pitham :

C.KABAM

Avalambagam :

Kilethagam :

Pothagam :

Tharpagam :

Santhigam :

UDALTHAATHUKKAL

Saaram :

Senner :

Oon :

Kozhuppu :

Enbu :

Moolai :

Sukkilam/Suronitham :

ENVAGAI THERVUGAL

1.Naa :

2.Niram :

3.Mozhi :

4.Vizhi :

5.Sparisam :

6.Malam :

7.Moothiram

a)Neer Kuri :

b)Nei Kuri :

8.Naadi :

MALAM

Niram :

Edai :

Erugal :

Elagal :

MOOTHIRAM

1.Neerkuri

Niram :

Manam :

Edai :

Nurai :

Enjal :

2.Neikuri

CLINICAL SIGNS AND SYMPTOMS OF PITHA PAANDU

Symptoms	Before Treatment	After Treatment						
		7 days	14 days	21 days	28 days	35 days	42 days	48 days
1. Pallor of conjunctiva and nail bed								
2. Fatigue								
3. Loss of appetite								
4. Dyspnoea on exertion								
5.Head ache								
6. Glossitis								
7. Giddiness								
8. Tachycardia								
9.Dimness of vision								
10.Tiredness								

INVESTIGATIONS

1.BLOOD	**BEFORE TREATMENT**	**AFTER TREATMENT**
TC		
DC		
Hb		
Blood sugar		
ESR (1/2 hr and 1 hr)		
Blood urea		
Serum cholesterol		

2.RED BLOOD CELL COUNT	**BEFORE TREATMENT**	**AFTER TREATMENT**

3.SPECIFIC INVESTIGATIONS	**BEFORE TREATMENT**	**AFTER TREATMENT**
PCV		
MCV		
MCH		
MCHC		

4. URINE

Albumin

Sugar

Deposits

5. MOTION

Ova

Cyst

Occult Blood

CASE SUMMARY

DIAGNOSIS

TRIAL DRUG: SARAKONDRAI CHOORANAM

Dose: 2 gm (Bds)

Adjuvant: Milk

Duration of Treatment: 48 days

PATHIAM (Do's and Don'ts)

Prognosis at the end of the Treatment:

Medical Officer Signature: **HOD**

DATE	DAILY REPORT	MEDICINE

ADVICE:

MEDICAL OFFICER: **H.O.D/Guide**

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